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OF

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1934

14

NOTICE

The present volume of TRANSACTIONS has been issued in two numbers representing the papers read from January, 1933, to December, 1933, before the College and its Sections. While a few of the papers are printed in full, most of the Proceedings are presented in abstract or by title only, giving when possible the reference to place of complete publication.

The College holds itself in no way responsible for the statements or opinions set forth in the various papers or abstracts in its TRANSACTIONS.

Edited by

J. HAROLD AUSTIN, M.D.

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OF THE

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SEPTEMBER, 1933

(For degrees and titles of Fellows elected before 1933 consult the TRANSACTIONS for 1932.)

* Non-Resident Fellows.

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1892. DR. ALEXANDER C. ABBOTT, 4016 Pine St., Philadelphia.

1912. DR. WILLIAM H. F. ADDISON, Med. Laboratories, University of Pennsylvania, Philadelphia.

1926. DR. FRANCIS HEED ADLER, 313 S. 17th St., Philadelphia.

1905. DR. LEWIS H. ADLER, JR., 313 S. 17th St., Philadelphia.

1914. DR. THOMAS G. AIKEN, Berwyn, Pa.

1906. DR. FRANCIS OLCOTT ALLEN, JR., 2216 Walnut St., Philadelphia.

1932. DR. FREDERICK H. ALLEN, 1711 Fitzwater St., Philadelphia.

1896. DR. HERMAN B. ALLYN, 3910 Chestnut St., Philadelphia.

1933. DR. ROBERT S. ALSTON, A.B., M.D., Surgeon to the Germantown Hospital. 121 Walnut Lane, Philadelphia.

1888. DR. JAMES M. ANDERS, 250 S. 17th St., Philadelphia.

1905. DR. BROOKE M. ANSPACH, 1827 Spruce St., Philadelphia.

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1922. DR. JOHN H. ARNETT, 2116 Pine St., Philadelphia.

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1914. DR. J. HAROLD AUSTIN, Maloney Clinic, Univ. Pa., Philadelphia.

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1911. Dr. Eldridge L. Eliason, 326 S. 19th St., Philadelphia.
1928. Dr. Richard T. Ellison, 111 Rex Ave., Philadelphia.
1904. Dr. Walter Gray Elmer, 1801 Pine St., Philadelphia.
1932. Dr. Gilson G. Engel, 1914 Pine St., Philadelphia.
1893. Dr. Augustus A. Eshner, 1019 Spruce St., Philadelphia.

*1905. Dr. Joseph S. Evans, Jr., 1300 University Ave., Madison Wis.
1905. Dr. William Evans, 500 W. Gay St., West Chester, Pa.
1912. Dr. Curtis C. Eves, 1910 Spruce St., Philadelphia.
1922. Dr. David L. Farley, 1725 Pine St., Philadelphia.
1903. Dr. Clifford B. Farr, Bryn Mawr, Pa.
1893. Dr. William W. Farr, 121 Maplewood Ave., Germantown, Philadelphia.
1930. Dr. John T. Farrell, Jr., 235 S. 15th St., Philadelphia.
1924. Dr. Alexander G. Fewell, 1924 Pine St., Philadelphia.
1907. Dr. Charles A. Fife, 2104 Spruce St., Philadelphia.
1884. Dr. Henry M. Fisher, Jenkintown, Pa.
1910. Dr. John Monroe Fisher, 345 S. 19th St., Philadelphia.
1928. Dr. Thomas Fitz-Hugh, Jr., 2020 Locust St., Philadelphia.
1928. Dr. John B. Flick, 1608 Spruce St., Philadelphia.
1888. Dr. Lawrence F. Flick, 736 Pine St., Philadelphia.
1916. Dr. John R. Forst, 166 W. Coulter St., Germantown, Philadelphia.
1908. Dr. Collin Foulkrod, 3910 Chestnut St., Philadelphia.
1933. Dr. Kenneth Fowler, A.B., M.D., Director, Department of Pathology, Presbyterian Hospital, Philadelphia. 2317 Delancey Place, Philadelphia.
1908. Dr. Herbert Fox, Haverford, Pa.
1906. Dr. Frederick Fraley, Overbrook, Pa.
1897. Dr. Charles H. Frazier, 3400 Spruce St., Philadelphia.
1933. Dr. James Scott Fritch, M.D., Associate in Ophthalmology, Jefferson Medical College; Chief of Eye Clinic, Jefferson Hospital. 269 S. 19th St., Philadelphia.
1928. Dr. Daniel H. Fuller, 4401 Market St., Philadelphia.
1933. Dr. Clarence J. Gamble, M.A., M.D., Instructor in Pharmacology, University of Pennsylvania, 537 Allen's Lane, Philadelphia.
1899. Dr. Robert G. Gamble, Haverford, Pa.
1931. Dr. Vaughn C. Garner, Germantown Professional Building, Philadelphia.
*1913. Dr. Nathaniel Gates, 10 Peterboro Ave., Detroit, Mich.
1917. Dr. Arthur H. Gerhard, 1615 N. Delaware Ave., Philadelphia.
1902. Dr. Albert A. Ghriskey, 3936 Walnut St., Philadelphia.

1899. Dr. John H. Gibbon, 1608 Spruce St., Philadelphia.
1933. Dr. U. Grant Gifford, M.D., Kennett Square, Pa.
1920. Dr. A. Bruce Gill, 1930 Chestnut St., Philadelphia.
1931. Dr. Robert L. Gilman, 1930 Chestnut St., Philadelphia.
1927. Dr. William R. Gilmour, 1737 Chestnut St., Philadelphia.
1931. Dr. Anthony A. S. Giordano, 1819 S. Broad St., Philadelphia.
1897. Dr. John H. Girvin, 2120 Walnut St., Philadelphia.
1920. Dr. Thomas S. Githens, The Cambridge, Wissahickon and School Lane, Philadelphia.
*1906. Dr. J. C. Gittings, 551 Maloney Clinic, 36th and Spruce Sts., Philadelphia.
1905. Dr. Ellis E. W. Given, 2714 Columbia Ave., Philadelphia.
1894. Dr. E. B. Gleason, 2112 Pine St., Philadelphia.
1906. Dr. R. Max Goepp, 518 Medical Arts Bldg., Philadelphia.
1906. Dr. Harold G. von Goldberg, 2213 Walnut St., Philadelphia.
1933. Dr. Harold Leon Goldburgh, M.D., Associate in Medicine, Jefferson Medical College; Assistant Visiting Physician to Philadelphia General Hospital and Jewish Hospital. 1932 Spruce St., Philadelphia.
*1908. Dr. Edward H. Goodman, Dorset, Vt.
1905. Dr. Alfred Gordon, 1812 Spruce St., Philadelphia.
1928. Dr. Burgess L. Gordon, 1832 Spruce St., Philadelphia.
1894. Dr. Edwin E. Graham, 1713 Spruce St., Philadelphia.
1926. Dr. Francis C. Grant, 3400 Spruce St., Philadelphia.
1904. Dr. Charles P. Grayson, 262 S. 15th St., Philadelphia.
1933. Dr. Sigmund S. Greenbaum, B.S., M.D., Associate Professor of Dermatology and Syphilology, Graduate School of Medicine, University of Pennsylvania; Dermatologist to Philadelphia General Hospital, Graduate Hospital and Mt. Sinai Hospital. 1714 Pine St., Philadelphia.
1910. Dr. Milton J. Greenman, Wistar Institute, 36th St. and Woodland Ave., Philadelphia.
1932. Dr. George C. Griffith, 3833 Walnut St., Philadelphia.
1883. Dr. J. P. Crozer Griffith, 1810 Spruce St., Philadelphia.
1912. Dr. J. Milton Griscom, 2213 Walnut St., Philadelphia.
1933. Dr. Charles Merl Michael Gruber, A.M., Ph.D., M.D., Professor of Pharmacology, Jefferson Medical College. 717 Edmonds Ave., Drexel Hill, Pa.

1932. Dr. Jacques P. Guequierre, Room 806, 1930 Chestnut St., Philadelphia.

*1902. Dr. Norman B. Gwyn, 109 Madison Ave., Toronto, Canada.

1894. Dr. S. McC. Hamill, 1822 Spruce St., Philadelphia.

1897. Dr. Alfred Hand, Jr., 1724 Pine St., Philadelphia.

1886. Dr. Howard F. Hansell, N. E. Corner 17th and Walnut Sts., Philadelphia.

1932. Dr. Stanley E. Harris, Lansdowne, Pa.

1929. Dr. Francis G. Harrison, 1900 Spruce St., Philadelphia.

1933. Dr. William John Harrison, P.D., M.D., Demonstrator in Ophthalmology, Jefferson Medical College; Clinical Assistant in Ophthalmology, Jefferson Hospital.
135 S. 17th St., Philadelphia.

1903. Dr. Charles D. Hart, Chestnut Hill, Philadelphia.

1926. Dr. Fred L. Hartmann, 1914 Pine St., Philadelphia.

1932. Dr. J. Calvin Hartman, 100 W. Walnut Lane, Philadelphia.

1907. Dr. Charles J. Hatfield, Phipps Institute, 7th and Lombard Sts., Philadelphia.

*1928. Dr. Joseph M. Hayman, Lakeside Hospital, Cleveland, O.

1911. Dr. Charles R. Heed, 1205 Spruce St., Philadelphia.

1901. Dr. John C. Heisler, 3829 Walnut St., Philadelphia.

1903. Dr. J. Norman Henry, 1906 Spruce St., Philadelphia.

1927. Dr. Leon Herman, 801 Medical Arts Bldg., Philadelphia.

1891. Dr. Addinell Hewson, 257 S. 16th St., Philadelphia.

1924. Dr. William Hewson, 6013 Greene St., Philadelphia.

*1892. Dr. Guy Hinsdale, White Sulphur Springs, W. Va.

1888. Dr. Barton Cooke Hirst, 1821 Spruce St., Philadelphia.

1924. Dr. John C. Hirst, 2d, 1918 Pine St., Philadelphia.

*1908. Dr. A. Parker Hitchens, Major M. C., U. S. A., in charge 6th Corps Area Laboratory, Ft. Sheridan, Ill.

1933. Dr. Lewis Haler Hitzrot, A.B., M.D., Instructor in Medicine, University of Pennsylvania.
1826 Pine St., Philadelphia.

1905. Dr. E. B. Hodge, 2019 Spruce St., Philadelphia.

1931. Dr. H. Albert Holland, 8200 Crittenden St., Philadelphia.

1933. Dr. Irving W. Hollingshead, M.D., 123 S. 18th St., Philadelphia.

1932. Dr. I. Pemberton P. Hollingsworth, 33 S. High St., West Chester, Pa.
1906. Dr. Thomas B. Holloway, 1819 Chestnut St., Philadelphia.
1919. Dr. Arthur H. Hopkins, 1726 Pine St., Philadelphia.
1925. Dr. R. Dale Hopkinson, Jenkintown, Pa.
1928. Dr. Karl M. Houser, 2010 Spruce St., Philadelphia.
1908. Dr. Daniel M. Hoyt, The Tracy, 36th and Chestnut Sts., Philadelphia.
*1912. Dr. G. Carl Huber, 1330 Hill Street, Ann Arbor, Mich.
1892. Dr. William E. Hughes, 3945 Chestnut St., Philadelphia.
1923. Dr. John E. Hume, N. E. Corner 20th and Chestnut Sts., Philadelphia.
*1912. Dr. John W. Hunter, McDaniel, Md.
1921. Dr. Robert J. Hunter, 2011 Chestnut St., Philadelphia.
1926. Dr. David N. Husik, 1930 Chestnut St., Philadelphia.
1898. Dr. J. P. Hutchinson, Media, Pa.
1921. Dr. Robert H. Ivy, 1930 Chestnut St., Philadelphia.
1917. Dr. Chevalier Jackson, 3432 N. Broad St., Philadelphia.
1932. Dr. Chevalier Lawrence Jackson, 3432 N. Broad St., Philadelphia.
*1885. Dr. Edward Jackson, 217 Imperial Bldg., Denver, Col.
1922. Dr. Howard L. Jameson, 2133 S. 16th St., Philadelphia.
1913. Dr. William H. Jefferys, Rosemont, Pa.
1930. Dr. Paul N. Jepson, 1824 Spruce St., Philadelphia.
1928. Dr. Rutherford L. John, 256 S. 21st St., Philadelphia.
1926. Dr. George Ernest Johnson, 5341 Chester Ave., Philadelphia.
1898. Dr. Russell H. Johnson, Chestnut Hill, Philadelphia.
1918. Dr. Leon Jonas, 1726 Pine St., Philadelphia.
1924. Dr. Harold W. Jones, Room 901, 1930 Chestnut St., Philadelphia.
1913. Dr. John F. X. Jones, 2056 N. 63d St., Philadelphia.
1900. Dr. John H. Jopson, 1824 Pine St., Philadelphia.
1900. Dr. Charles F. Judson, 1005 Spruce St., Philadelphia.
1902. Dr. Henry D. Jump, 2019 Walnut St., Philadelphia.
1903. Dr. F. J. Kalteyer, 1530 Locust St., Philadelphia.
*1910. Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland, Ohio.
1926. Dr. Isadore Kaufman, 1616 Walnut St., Philadelphia.

1923. Dr. James Kay, 600 W. Olney Ave., Philadelphia.
1912. Dr. Floyd E. Keene, 133 S. 36th St., Philadelphia.
1913. Dr. Francis J. Kelly, 2211 Locust St., Philadelphia.
1932. Dr. Herbert T. Kelly, 1900 Spruce St., Philadelphia.
*1887. Dr. Howard A. Kelly, 1418 Eutaw Place, Baltimore, Md.
1909. Dr. James A. Kelly, 1815 Spruce St., Philadelphia.
1912. Dr. Thomas C. Kelly, 105 School Lane, Philadelphia.
1898. Dr. A. F. Kempton, 2118 Pine St., Philadelphia.
1905. Dr. Delno E. Kercher, 1534 Pine St., Philadelphia.
1921. Dr. Richard A. Kern, University Hospital, 36th and Spruce Sts., Philadelphia.
1930. Dr. Robert A. Kimbrough, Jr., 255 S. 17th St., Philadelphia.
1931. Dr. Willard H. Kinney, 315 S. 17th St., Philadelphia.
1920. Dr. Joseph V. Klauder, 1934 Spruce St., Philadelphia.
1920. Dr. Thomas Klein, 250 S. 18th St., Philadelphia.
1913. Dr. Edward J. Klopp, 1611 Spruce St., Philadelphia.
1932. Dr. John W. Klopp, 618 W. Lehigh Ave., Philadelphia.
1908. Dr. Jay C. Knipe, 1737 Chestnut St., Philadelphia.
1919. Dr. Norman L. Knipe, 1930 Chestnut St., Philadelphia.
1908. Dr. Frank C. Knowles, 2035 Spruce St., Philadelphia.
1925. Dr. Harry E. Knox, 719 66th Ave., Oak Lane, Philadelphia.
1914. Dr. John A. Kolmer, Cynwyd, Pa.
1932. Dr. Karl Kornblum, Wynnewood, Pa.
1904. Dr. Frederick Krauss, Room 703, 1930 Chestnut St., Philadelphia.
1914. Dr. Edward B. Krumbhaar, Box 4310, Chestnut Hill, Philadelphia.
1900. Dr. Wilmer Krusen, Lansdowne, Pa.
1932. Dr. Eugene M. Landis, University Hospital, 36th and Spruce Sts., Philadelphia.
1904. Dr. Henry R. M. Landis, Phipps Institute, 7th and Lombard Sts., Philadelphia.
1907. Dr. H. Maxwell Langdon, 1530 Locust St., Philadelphia.
1933. Dr. Roy L. Langdon, School and Gypsy Lanes, Philadelphia.
1926. Dr. George Malcolm Laws, 1907 Spruce St., Philadelphia.
1920. Dr. Frederic H. Leavitt, 1527 Pine St., Philadelphia.

1904. Dr. Theodore Le Boutillier, 1930 Chestnut St., Philadelphia.
1908. Dr. Walter E. Lee, 905 Pine St., Philadelphia.
1920. Dr. Simon S. Leopold, 2025 Spruce St., Philadelphia.
1933. Dr. J. Walter Levering, M.D., Visiting Surgeon at Abington Memorial Hospital. 1309 Oak Lane, Philadelphia.
1915. Dr. Fielding O. Lewis, 259 S. 17th St., Philadelphia.
1904. Dr. Eugene Lindauer, 6451 N. Broad St., Philadelphia.
1927. Dr. Walter H. Lindsey, S. E. Corner 17th and Arch Sts., Philadelphia.
1907. Dr. Edward Lodholz, Medical Laboratories, University of Pennsylvania, Philadelphia.
1931. Dr. S. A. Loewenberg, 1905 Spruce St., Philadelphia.
1933. Dr. Esmond Ray Long, M.D., Ph.D., Professor of Pathology, School of Medicine, and Director of the Laboratories of the Henry Phipps Institute, University of Pennsylvania. The Phipps Institute, 7th and Lombard Sts., Philadelphia.
1893. Dr. Daniel Longaker, 1806 Spruce St., Philadelphia.
1931. Dr. Edwin P. Longaker, 1806 Spruce St., Philadelphia.
1921. Dr. Baldwin H. E. Lucke, Medical School, University of Pennsylvania, Philadelphia.
1924. Dr. John B. Ludy, 1201 Medical Arts Bldg., Philadelphia.
1923. Dr. Charles W. Lueders, 1930 Chestnut St., Philadelphia.
1932. Dr. Francis D. W. Lukens, University Hospital, 36th and Spruce Sts., Philadelphia.
1930. Dr. Robert M. Lukens, 1923 Spruce St., Philadelphia.
1929. Dr. Clifford B. Lull, 1731 Pine St., Philadelphia.
1919. Dr. Frank B. Lynch, Jr., Germantown Hospital, E. Wister St., Philadelphia.
1914. Dr. B. B. Vincent Lyon, 2031 Locust St., Philadelphia.
1933. Dr. Leo F. McAndrews, A.B., M.D., M.Sc., Instructor in Ophthalmology, Jefferson Medical College.
1930 Chestnut St., Philadelphia.
1932. Dr. James F. McCahey, 1709 Pine St., Philadelphia.
1900. Dr. Daniel J. McCarthy, 2025 Walnut St., Philadelphia.
1931. Dr. Edward McCloskey, 7 E. Chestnut Ave., Chestnut Hill, Philadelphia.
1913. Dr. Thomas McCrae, 1929 Spruce St., Philadelphia.

1895. Dr. Joseph McFarland, 542 W. Hortter St., Germantown, Philadelphia.
1931. Dr. Joseph McIver, 133 S. 36th St., Philadelphia.
1905. Dr. R. Tait McKenzie, 2014 Pine St., Philadelphia.
*1916. Dr. Howard A. McKnight, Tecumseh Bldg., Springfield, Ohio.
1933. Dr. James S. McLaughlin, 334 S. 21st St., Philadelphia.
1924. Dr. Thomas M. McMillan, 2044 Locust St., Philadelphia.
1924. Dr. F. Maurice McPhedran, Phipps Institute, 7th and Lombard Sts., Philadelphia.
*1900. Dr. Robert Phillips McReynolds, 213 S. Broadway, Los Angeles, Cal.
1932. Dr. Catharine Macfarlane, Medical Arts Bldg., Philadelphia.
1910. Dr. William H. Mackinney, 1930 Chestnut St., Philadelphia.
1914. Dr. F. Hurst Maier, 2019 Walnut St., Philadelphia.
1913. Dr. Willis F. Manges, 235 S. 15th St., Philadelphia.
1898. Dr. G. Morley Marshall, 1819 Spruce St., Philadelphia.
1889. Dr. Edward Martin, 135 S. 18th St., Philadelphia.
1932. Dr. Richard H. Meade, Jr., 200 W. Mermaid Lane, Philadelphia.
*1911. Dr. Edward B. Meigs, 1736 M St. N. W., Washington, D. C.
1914. Dr. J. Bernhard Mencke, 1816 Spruce St., Philadelphia.
1923. Dr. Walter Mendelson, 639 Church Lane, Germantown, Philadelphia.
1914. Dr. William J. Merrill, 2017 Spruce St., Philadelphia.
*1894. Dr. D. J. Milton Miller, N. W. Corner Pacific and California Aves., Atlantic City, N. J.
1932. Dr. M. Valentine Miller, 44 W. Phil-Ellena St., Philadelphia.
1921. Dr. T. Grier Miller, University Hospital, 36th and Spruce Sts., Philadelphia.
*1917. Dr. A. Graeme Mitchell, University of Cincinnati, Cincinnati, O.
1904. Dr. Charles F. Mitchell, 2003 Pine St., Philadelphia.
1921. Dr. Henry K. Mohler, 319 S. 16th St., Philadelphia.
1932. Dr. Roy W. Mohler, 323 S. 20th St., Philadelphia.

1932. Dr. Thaddeus L. Montgomery, 1930 Chestnut St., Philadelphia.
1928. Dr. Virgil H. Moon, Jefferson Medical College, Philadelphia.
1923. Dr. William F. Moore, 255 S. 16th St., Philadelphia.
1924. Dr. Stirling W. Moorhead, 1523 Pine St., Philadelphia.
1918. Dr. Arthur C. Morgan, 1930 Chestnut St., Philadelphia.
1886. Dr. Caspar Morris, Haverford, Pa.
1893. Dr. Elliston J. Morris, 128 S. 18th St., Philadelphia.
1929. Dr. Stuart Mudd, Haverford, Pa.
1905. Dr. George P. Müller, 1930 Spruce St., Philadelphia.
1930. Dr. Douglas P. Murphy, 4312 Pine St., Philadelphia.
*1915. Dr. John H. Musser, Jr., 1427 2d St., New Orleans, La.
1905. Dr. Louis H. Mutschler, 1625 Spruce St., Philadelphia.
1902. Dr. Charles F. Nassau, 1710 Locust St., Philadelphia.
1887. Dr. Thomas R. Neilson, 1937 Chestnut St., Philadelphia.
1905. Dr. William S. Newcomet, 3501 Baring St., Philadelphia.
1905. Dr. Arthur Newlin, 1804 Pine St., Philadelphia.
1899. Dr. William R. Nicholson, 2023 Spruce St., Philadelphia.
1889. Dr. Charles P. Noble, Radnor, Pa.
1905. Dr. Charles C. Norris, 133 S. 36th St., Philadelphia.
*1905. Dr. George W. Norris, Dimock, Pa.
*1901. Dr. Henry Norris, Waverly Mills, So. Car.
1892. Dr. Richard C. Norris, 500 N. 20th St., Philadelphia.
1933. Dr. Josef B. Nylin, M.D., Chief of Clinic, Department of Physical Therapy, University Hospital; Associate in Physical Therapy, School of Medicine and Graduate School of Medicine, University of Penna.; Assistant Professor of Physical Therapy, Woman's Medical College. University Hospital, Philadelphia.
1913. Dr. Alexander Hay O'Neal, St. Davids, Pa.
1913. Dr. George W. Outerbridge, 1927 Spruce St., Philadelphia.
1915. Dr. Hubley R. Owen, 319 S. 16th St., Philadelphia.
1897. Dr. Francis R. Packard, 304 S. 19th St., Philadelphia.
1898. Dr. Henry F. Page, 315 S. 16th St., Philadelphia.
1933. Dr. Harold Dean Palmer, B.S., M.D., Psychiatrist to Institute of the Pennsylvania Hospital; Psychiatrist to the Student Health Service and Instructor in Psychiatry, University of Penna.; Assistant Visiting Physician,

Psychopathic Department, Philadelphia General Hospital. 111 N. 49th St., Philadelphia.

1906. Dr. Henry K. Pancoast, Grays Lane, Haverford, Pa.
1909. Dr. Benjamin D. Parish, 1927 Spruce St., Philadelphia.
1899. Dr. William E. Parke, 1534 N. 15th St., Philadelphia.
1925. Dr. Clarence A. Patten, 2037 Delancey St., Philadelphia.
1910. Dr. Ross V. Patterson, 2126 Spruce St., Philadelphia.
1931. Dr. John Davis Paul, 3112 N. Broad St., Philadelphia.
*1926. Dr. John Rodman Paul, Dept. Internal Medicine, Yale University, New Haven, Conn.
1932. Dr. Franklin L. Payne, 133 S. 36th St., Philadelphia.
1922. Dr. P. S. Pelouze, 1737 Chestnut St., Philadelphia.
1909. Dr. Ralph Pemberton, Paoli, Pa.
1930. Dr. Eugene P. Pendergrass, Ardmore, Pa.
1932. Dr. Howard Y. Pennell, West Chester, Pa.
1914. Dr. O. H. Perry Pepper, University Hospital, 36th and Spruce Sts., Philadelphia.
1902. Dr. William Pepper, School of Medicine, University of Pennsylvania, Philadelphia.
1916. Dr. Milton F. Percival, 2332 S. Broad St., Philadelphia.
1917. Dr. Luther C. Peter, 1930 Chestnut St., Philadelphia.
1905. Dr. George E. Pfahler, 1930 Chestnut St., Philadelphia.
1915. Dr. Damon B. Pfeiffer, 1822 Pine St., Philadelphia.
1907. Dr. George W. Pfromm, Room 803, 269 S. 19th St., Philadelphia.
1907. Dr. Horace Phillips, 4505 Chester Ave., Philadelphia.
1911. Dr. George Morris Piersol, 1913 Spruce St., Philadelphia.
1933. Dr Donald Marion Pillsbury, M.A., M.D., Assistant Professor of Dermatology and Syphilology, School of Medicine, University of Pennsylvania.
3800 Chestnut St., Philadelphia.
1917. Dr. Edmund B. Piper, 2031 Locust St., Philadelphia.
1905. Dr. Robert L. Pitfield, 5211 Wayne Ave., Philadelphia.
1922. Dr. Henry Pleasants, Jr., West Chester, Pa.
1932. Dr. Roland De Lance Porter, Jenkintown, Pa.
1896. Dr. W. Campbell Posey, Radnor, Pa.
*1907. Dr. George E. Price, Stimson Bldg., Seattle, Wash.
1931. Dr. Charles A. Pryor, 1910 Spruce St., Philadelphia.
1908. Dr. McCluney Radcliffe, 1930 Chestnut Street, Philadelphia.

1931. Dr. Frank M. Ramsey, Chestnut Hill, Philadelphia.
1913. Dr. Alexander Randall, 1323 Medical Arts Bldg., Philadelphia.
1926. Dr. I. S. Ravdin, 4623 Larchwood Ave., Philadelphia.
*1904. Dr. M. P. Ravenel, 203 Westmount Ave., Columbia, Mo.
1928. Dr. Warren S. Reese, 230 S. 21st St., Philadelphia.
1925. Dr. Rufus S. Reeves, 2227 Spruce St., Philadelphia.
1931. Dr. Robert P. Regester, 255 S. 16th St., Philadelphia.
1920. Dr. Martin E. Rehfuss, N. E. Corner 16th and Spruce Sts., Philadelphia.
1921. Dr. E. Paul Reiff, 5051 Chestnut St., Philadelphia.
1919. Dr. Stanley P. Reimann, 516 Arbutus St., Germantown, Philadelphia.
1929. Dr. George S. de Rényi, 216 S. 46th St., Philadelphia.
1923. Dr. Sidney J. Repplier, Roumfort Road, Chestnut Hill, Philadelphia.
1919. Dr. Russell Richardson, 320 S. 16th St., Philadelphia.
1919. Dr. Robert F. Ridpath, 1737 Chestnut St., Philadelphia.
1898. Dr. David Riesman, 1520 Spruce St., Philadelphia.
1933. Dr. Damaso de Rivas, M.S., M.D., Ph.D., Assistant Professor of Parasitology, School of Medicine, and Professor of Parasitology, Graduate School of Medicine, University of Pennsylvania; Pathologist to Pennsylvania Department of Health and to Friends' Hospital, Frankford. Lansdowne, Pa.
1932. Dr. Frederick R. Robbins, 258 S. 18th St., Philadelphia.
1899. Dr. Walter Roberts, 1921 Spruce St., Philadelphia.
1932. Dr. Harold F. Robertson, 327 S. 17th St., Philadelphia.
1903. Dr. William Egbert Robertson, 327 S. 17th St., Philadelphia.
1912. Dr. John Stewart Rodman, 1310 Medical Arts Bldg., Philadelphia.
1928. Dr. Edward Rose, 1726 Pine St., Philadelphia.
1909. Dr. Randle C. Rosenberger, 1009 Walnut St., Philadelphia.
1932. Dr. Harry A. Rothrock, West Chester, Pa.
1933. Dr. Leonard George Rowntree, M.D., Sc.D., Director of the Philadelphia Institute for Medical Research; Research Clinician to Philadelphia General Hospital. The Barclay, 18th and Rittenhouse Sts., Philadelphia.

*1907. Dr. B. Franklin Royer, Tunkhannock, Pa.

1933. Dr. Jay Besson Rudolphy, M.D., Assistant Professor of Ophthalmology, Graduate School of Medicine, and Instructor in Ophthalmology, School of Medicine, University of Pennsylvania; Ophthalmologist and Chief of Out-patient Clinic at Pennsylvania Hospital; Neuro-ophthalmologist to Philadelphia General Hospital. 1924 Pine St., Philadelphia.

1905. Dr. J. Torrance Rugh, 911 Medical Arts Bldg., Philadelphia.

1929. Dr. William J. Ryan, Medical Arts Bldg., Philadelphia.

1905. Dr. Paul J. Sartain, 2006 Walnut St., Philadelphia.

1908. Dr. Albert C. Sautter, Germantown Professional Bldg., Philadelphia.

1927. Dr. Gordon J. Saxon, 1506 Medical Arts Bldg., Philadelphia.

1906. Dr. Edwin S. Saylor, 1737 Chestnut St., Philadelphia.

1920. Dr. Hunter W. Scarlett, 230 S. 21st St., Philadelphia.

1917. Dr. J. Parsons Schaeffer, 4634 Spruce St., Philadelphia.

1932. Dr. Howard W. Schaffer, 3475 Midvale Ave., Philadelphia.

1899. Dr. Jay F. Schamberg, 1402 Spruce St., Philadelphia.

1929. Dr. Lewis C. Scheffey, N. E. Corner 19th and Spruce Sts., Philadelphia.

1929. Dr. Harry P. Schenck, 1912 Spruce St., Philadelphia.

1917. Dr. Truman G. Schnabel, 1704 Pine St., Philadelphia.

1917. Dr. Charles H. Schoff, Media, Pa.

1928. Dr. Frederick S. Schofield, 822 Medical Arts Bldg., Philadelphia.

1921. Dr. Edward A. Schumann, 1814 Spruce St., Philadelphia.

1887. Dr. George E. de Schweinitz, 1705 Walnut St., Philadelphia.

*1913. Dr. George L. de Schweinitz, 85 East Broad St., Bethlehem, Pa.

1910. Dr. Peter N. K. Schwenk, 1417 N. Broad St., Philadelphia.

1930. Dr. John P. Scott, 1803 Pine St., Philadelphia.

1917. Dr. Charles A. Service, Bala, Pa.

1924. Dr. Thomas A. Shallow, 3942 Chestnut St., Philadelphia.

1908. Dr. Charles E. G. Shannon, Room 1107, 1930 Chestnut St., Philadelphia.
1928. Dr. John S. Sharpe, Haverford, Pa.
1928. Dr. Frederick C. Sharpless, Rosemont, Pa.
1897. Dr. William T. Sharpless, West Chester, Pa.
1931. Dr. William C. Sheehan, 8820 Germantown Ave., Philadelphia.
1932. Dr. Joyce T. Sheridan, 412 W. Durham St., Philadelphia.
1906. Dr. William G. Shields, 414 School Lane, Philadelphia.
*1908. Dr. Harlan Shoemaker, 1930 Wilshire Bldg., Los Angeles, Cal.
1896. Dr. William T. Shoemaker, 2017 Locust St., Philadelphia.
1900. Dr. Edward A. Shumway, 1737 Chestnut St., Philadelphia.
1932. Dr. Alvin E. Siegel, 2021 Spruce St., Philadelphia.
1903. Dr. John F. Sinclair, 4103 Walnut St., Philadelphia.
1907. Dr. Francis W. Sinkler, 1226 Medical Arts Bldg., Philadelphia.
1902. Dr. E. Hollingsworth Siter, 2213 Delancey St., Philadelphia.
1928. Dr. Samuel R. Skillern, 1734 Pine St., Philadelphia.
1933. Dr. Donald Campbell Smelzer, M.D., C.M. (McGill), Director of the Graduate Hospital, University of Pennsylvania. The Graduate Hospital, Philadelphia.
1929. Dr. Austin T. Smith, 259 S. 17th St., Philadelphia.
1933. Dr. Lauren Howe Smith, B.S., M.D., Executive Medical Officer, Institute of the Pennsylvania Hospital; Associate in Psychiatry, School of Medicine, University of Pennsylvania. 111 N. 49th St., Philadelphia.
1919. Dr. Henry Field Smyth, Wayne, Pa.
1933. Dr. Varnum C. Southworth, M.D., Instructor in Orthopedic Surgery, School of Medicine, University of Pennsylvania. 617 W. Mt. Airy Ave., Philadelphia.
1933. Dr. Edgar W. Spackman, M.D., M.Sc. (Med.), 1824 Chestnut St., Philadelphia.
1928. Dr. Edmund B. Spaeth, 1930 Chestnut St., Philadelphia.
1908. Dr. John Speese, 133 S. 36th St., Philadelphia.
1897. Dr. William G. Spiller, 4409 Pine St., Philadelphia.
1929. Dr. Marshall B. Sponsler, 1934 Spruce St., Philadelphia.
1894. Dr. B. Franklin Stahl, Haverford, Pa.

1909. Dr. J. Clinton Starbuck, 42 East Washington St., Media, Pa.
1927. Dr. Isaac Starr, Jr., 505 Cresheim Valley Rd., Philadelphia.
1912. Dr. Nathan P. Stauffer, 1900 Rittenhouse Sq., Philadelphia.
1910. Dr. Thomas C. Stellwagen, Jr., 220 S. 16th St., Philadelphia.
1895. Dr. Alfred Stengel, Maloney Bldg., University Hospital, 36th and Spruce Sts., Philadelphia.
1901. Dr. Arthur A. Stevens, 314 S. 16th St., Philadelphia.
1914. Dr. Thomas S. Stewart, 1532 Pine St., Philadelphia.
1931. Dr. Merritt H. Stiles, 113 W. Chestnut Ave., Philadelphia.
1925. Dr. John H. Stokes, 3800 Chestnut St., Philadelphia.
1928. Dr. Joseph Stokes, Jr., 159 W. Coulter St., Philadelphia.
1923. Dr. Edward A. Strecker, 111 N. 49th St., Philadelphia.
1923. Dr. William D. Stroud, 1011 Clinton St., Philadelphia.
1933. Dr. Harry Stuckert, M.D., 248 S. 21st St., Philadelphia.
1927. Dr. Samuel B. Sturgis, Ardmore, Pa.
1930. Dr. F. William Sunderman, 2210 Delancey St., Philadelphia.
*1900. Dr. John M. Swan, 457 Park Ave., Rochester, N. Y.
1928. Dr. William B. Swartley, 6002 Greene St., Philadelphia.
1900. Dr. James Ely Talley, 1811 Spruce St., Philadelphia.
1933. Dr. Herbert W. Taylor, A.B., M.D., Attending Physician at Bryn Mawr Hospital; Physician to Haverford College. Haverford, Pa.
1931. Dr. Norman H. Taylor, 100 W. Evergreen Ave., Philadelphia.
1887. Dr. William J. Taylor, 1825 Pine St., Philadelphia.
1928. Dr. J. Earl Thomas, Drexel Hill, Pa.
1907. Dr. T. Turner Thomas, 1737 Chestnut St., Philadelphia.
1927. Dr. J. Monroe Thorington, 2031 Chestnut St., Philadelphia.
1898. Dr. Edward Q. Thornton, 1331 Pine St., Philadelphia.
1930. Dr. Edward S. Thorpe, Jr., 133 S. 36th St., Philadelphia.
1912. Dr. Robert G. Torrey, 1716 Locust St., Philadelphia.
1908. Dr. Stephen E. Tracy, 1930 Chestnut St., Philadelphia.
1926. Dr. Gabriel Tucker, 326 S. 19th St., Philadelphia.

1933. Dr. Henry J. Tumen, A.B., M.D., Associate in Medicine, Graduate School of Medicine, University of Pennsylvania; Associate in Medicine, Temple University School of Medicine. 2022 Spruce St., Philadelphia.

1894. Dr. Joseph Price Tunis, University Club, Philadelphia.

1923. Dr. Creighton H. Turner, 1731 Pine St., Philadelphia.

1929. Dr. Ralph M. Tyson, 334 S. 21st St., Philadelphia.

1907. Dr. Josephus T. Ullom, Carpenter and Quincy Sts., Philadelphia.

*1913. Dr. William Penn Vail, Blairstown, N. J.

1873. Dr. Arthur Van Harlingen, Bryn Mawr, Pa.

1903. Dr. William Turner Van Pelt, 59 Bethlehem Pike, Chestnut Hill, Philadelphia.

1933. Dr. Jacob Hursh Vastine, 2d, M.D., Clinical Professor of Radiology, Woman's Medical College; Radiologist at Woman's College Hospital.
267 Kent Rd., Wynnewood, Pa.

1912. Dr. Norris Wistar Vaux, 2031 Locust St., Philadelphia.

*1897. Dr. Clarence A. Veasey, Suite 1569, Paulson Bldg., Spokane, Wash.

1903. Dr. William S. Wadsworth, 3914 Baltimore Ave., Philadelphia.

1927. Dr. Arthur J. Wagers, 1429 Spruce St., Philadelphia.

1928. Dr. George W. Wagoner, Haverford Gables, Haverford, Pa.

1931. Dr. Herschel C. Walker, Wynnewood, Pa.

1906. Dr. John K. Walker, Media, Pa.

1907. Dr. Warren Walker, 1819 Chestnut St., Philadelphia.

1932. Dr. Adolph A. Walkling, Medical Arts Bldg., Philadelphia.

1904. Dr. Joseph Walsh, 412 Medical Arts Bldg., Philadelphia.

1895. Dr. Arthur W. Watson, 2013 Locust St., Philadelphia.

1923. Dr. William R. Watson, 2124 Pine St., Philadelphia.

1932. Dr. Charles C. Watt, Jr., 6605 Wayne Ave., Philadelphia.

1933. Dr. James Jamison Waygood, Ph.B., M.D., Neurologist and Chief of Neuropsychiatric Clinic, St. Christopher's Hospital; Neuropsychiatrist to Delaware County Hospital; Medical Director of Roseneath Farms Sanitarium.
3464 W. School Lane, Philadelphia.

1903. Dr. Charles H. Weber, 2048 Pine St., Philadelphia.

1930. Dr. S. Dana Weeder, 6110 Greene St., Philadelphia.
1920. Dr. Fred D. Weidman, 20 Tenby Road, Llanerch, Pa.
1906. Dr. Theodore H. Weisenburg, Room 7, 1930 Chestnut St., Philadelphia.
1933. Dr. Benjamin Paul Weiss, M.D., Assistant Professor of Nervous and Mental Diseases, Jefferson Medical College; Director of Neuropsychiatric Department, Germantown Hospital; Assistant Neurologist, Philadelphia General Hospital. The Lenox, 13th and Spruce Sts., Philadelphia.
1923. Dr. Edward Weiss, 1923 Spruce St., Philadelphia.
1913. Dr. P. Frailey Wells, 754 N. 40th St., Philadelphia.
1921. Dr. William Whitaker, 5448 Germantown Ave., Philadelphia.
1901. Dr. Courtland Y. White, 6611 N. 10th St., Philadelphia.
1925. Dr. Bernard P. Widmann, 250 S. 18th St., Philadelphia.
1914. Dr. De Forest P. Willard, 1726 Spruce St., Philadelphia.
1907. Dr. Carl Williams, School Lane and Greene St., Philadelphia.
1924. Dr. Horace J. Williams, 5908 Greene St., Philadelphia.
1920. Dr. Philip F. Williams, 2206 Locust St., Philadelphia.
1927. Dr. Ernest G. Williamson, 6353 Woodbine Ave., Philadelphia.
1916. Dr. Harry B. Wilmer, 6013 Greene St., Philadelphia.
1921. Dr. George Wilson, 133 S. 36th St., Philadelphia.
1874. Dr. James C. Wilson, 1509 Walnut St., Philadelphia.
1902. Dr. Samuel M. Wilson, 1930 Chestnut St., Philadelphia.
1897. Dr. W. Reynolds Wilson, Villa Nova, Pa.
1904. Dr. James W. Wister, 5430 Germantown Ave., Philadelphia.
*1901. Dr. A. Ferree Witmer, 21 N. Grand Ave., Baldwin, N. Y.
1933. Dr. Michael G. Wohl, M.D., Associate Professor of Medicine, Temple University Medical School; Chief of Endocrine Clinic, Temple University Hospital; Assistant Physician, Philadelphia General Hospital; Attending Physician, Northern Liberties Hospital.
1727 Pine St., Philadelphia.
1918. Dr. Charles C. Wolferth, S. E. Corner 36th and Spruce Sts., Philadelphia.
1893. Dr. Alfred C. Wood, 2035 Walnut St., Philadelphia.
1932. Dr. Francis C. Wood, Wynnewood, Pa.

1900. Dr. George B. Wood, N. E. Corner 20th and Chestnut Sts., Philadelphia.

1903. Dr. Horatio C. Wood, 319 S. 41st St., Philadelphia.

*1911. Dr. Andrew H. Woods, 1100 N. Dubuque St., Iowa City, Iowa.

1897. Dr. George Woodward, W. Willow Grove Ave., Chestnut Hill, Philadelphia.

1928. Dr. Carroll S. Wright, 1402 Spruce St., Philadelphia.

1894. Dr. William Zentmayer, Room 803, 1930 Chestnut St., Philadelphia.

1895. Dr. Mason W. Zimmerman, 1518 Waverly St., Philadelphia.

1931. Dr. José Zozaya, Gladwynne, Pa.

1933. Dr. J. Donald Zulick, M.D., Roentgenologist to Abington Memorial Hospital and to Kensington Hospital for Women. 2008 Walnut St., Philadelphia.

HONORARY FELLOWS

(Limited to Fifty, of whom Twenty may be Foreigners)

American

ELECTED

1893. Councilman, William T., M.D., Harvard Medical College, Boston, Mass.

1909. Crile, George W., M.D., Cleveland Clinic, Euclid Ave. at E. Ninety-third St., Cleveland, O.

1909. Dana, Charles Loomis, M.D., 53 West Fifty-third St., New York City, N. Y.

1916. Estes, William Lawrence, M.D., 805 Delaware Ave., Bethlehem, Pa.

1931. Garrison, Fielding H., M.D., 1900 E. Monument St., Baltimore, Md.

1912. McCaw, Brig.-Gen. Walter D., M.D., Assistant Surgeon-General, U. S. A., retired, Woodstock, Ulster Co., N. Y.

1906. Mayo, William J., M.D., Rochester, Minn.

1917. Miner, Charles H., M.D., Wilkes-Barre, Pa.

1906. Pilcher, Lewis Stephen, M.D., 386 Park St., Upper Montclair, N. J.

1892. Welch, William H., M.D., 1900 E. Monument St., Baltimore, Md.

Foreign

1928. Archibald, Edward, M.D., McGill University, Montreal, Canada.

1924. Hopkins, Sir F. Gowland, M.D., Biochemical Department, University of Cambridge, Cambridge, England.

1909. Macallum, Archibald B., M.A., M.B., Ph.D., Sc.D., LL.D., F.R.S., 317 Piccadilly St., London, Ontario.

1922. McCarrison, Colonel Robert, M.D., C.I.E., D.Sc., LL.D., F.R.C.P. (London), Honorary Physician to the King. Pasteur Institute, Coonoor, S. India.

1924. Macleod, John James R., M.D., M.B., D.Sc. (Hon.), LL.D., F.R.S., Marischal College, Aberdeen, Scotland.

1906. Myles, Sir Thomas, M.D., 33 Merion Square, W. Dublin, Ireland.

1885. Rendu, Jean, M.D., Lyons, France.

1928. Rolleston, Sir Humphry, Bart., G.C.V.O., K.C.B., M.D., D.C.L. (Durh.), LL.D., D.Sc., Martins, Haslemere, Surrey, England.

NECROLOGICAL LIST

Fellows

DR. G. ORAM RING	January	17, 1933
DR. THOMPSON S. WESTCOTT	January	28, 1933
DR. ALBERT D. WHITING	February	18, 1933
DR. THOMAS G. ASHTON	February	23, 1933
DR. J. CHALMERS DACOSTA	May	16, 1933
DR. WILLIAM T. COUNCILMAN (Hon.)	May	26, 1933

MEMOIR OF DR. BURTON ALEXANDER RANDALL *

By JAMES A. BABBITT, M.D.

Dr. B. Alexander Randall, Emeritus Professor of Otology of the University of Pennsylvania, died at his home in Philadelphia, on January 4, 1932. Although he had retired from active practice, he remained conspicuous in all councils of otolaryngology, and commanded the constant love and respect of his colleagues in local, national and international organizations. His death came so quickly that one could hardly realize his absence from this associated activity.

Dr. Randall was descended from the famous old Randall family of Maryland. The senior Alexander Randall was a lawyer and president of the Farmers National Bank of Annapolis. Dr. Randall received his collegiate education at St. John's College in Annapolis, the city of his birth, in 1858. He received an M.A. degree from St. John's, Medical and Ph.D. degrees from the University of Pennsylvania; his Pennsylvania medical graduation thesis shared the first honors prize; and took postgraduate research study at the University of Vienna with the famous Politzer. In 1888 he attended the International Ophthalmological Congress in Heidelberg and the International Otological Congress in Brussels, reading papers before both meetings. Few realize the respect and esteem accorded him by noted otologists across the water. Beside otology and laryngology, his knowledge of and opinions in ophthalmology, pathology and anatomy were never questioned, and his writings were accepted as authoritative medical texts.

His service to Philadelphia in the specialties of the eye and ear was a complete and generous one. Commencing as student demonstrator in anatomy in 1879, he was in continuous hospital service until his retirement from the University in 1924, and beside the University his Philadelphia hospital connections had included active service at Episcopal, Polyclinic, Children's, Methodist, Rush, Woman's and St. Timothy's.

* Read January 9, 1933.

He was Assistant Demonstrator of Histology in the University Medical Department from 1880 to 1882, Eye and Ear Surgeon to the Episcopal Hospital from 1882 to 1891, appointed to the Children's Hospital in 1885, Professor of Diseases of the Ear at the University of Pennsylvania from 1891 to 1924. His final teaching service was in the Graduate School of the University after retirement from undergraduate work.

The esteem of Dr. Randall's medical confrères is attested by the importance of his fellowships—he was a Fellow of the American Ophthalmological Society, Fellow and former President of the American Otological Society, Fellow of the American Laryngological Association, Fellow of the College of Physicians of Philadelphia and member of the Philadelphia Pathological Society. He served for many years on the Hall Committee of the College of Physicians, and he was practically the founder of its Section on Otolaryngology, of which he was later elected to honorary membership.

It is not customary in a memorial of this sort to review in detail the scientific contributions of a deceased Fellow of the Society. These have been recorded most accurately in the special journals. One cannot help, however, emphasizing his enormous scientific contribution. Perhaps Dr. Randall will be remembered more particularly for his co-authorship with Dr. Morse of "Photographic Illustrations of the Anatomy of the Ear," and with Dr. deSchweinitz in the American Textbook of Diseases of the Eye, Ear, Nose and Throat. We find a record, however, of 144 distinct contributions which range over the wide field of the vascularity and refraction of the eye, unique pathologic conditions of the eye, anatomic studies and the application of these to the public school life, minute anatomic studies in comparative anatomy, and every type of pathologic disturbance of the middle and internal ear and mastoid complications, painstaking discussion of the surgical treatment of cholesteatoma, drum head and ossicles, study in the physical properties of sound, neoplasms, intracranial abscess of otitic origin, diagnostic studies in connection with the non-acoustic labyrinth, and intimate directions to students of both eye and ear. It is difficult to conceive how one man in the limited space of his life could accomplish so much really important literary service. Much of it involved painstaking work in anatomic dissection at the Wistar Institute.

During the war he served as civilian instructor in connection with Bárány tests for aviation, and he received a note of appreciation from Surgeon General Gorgas on behalf of the Medical Department of the Army for the part he had taken in this work. Dr. Randall's crowning literary achievement, his own Textbook on Otology, was never completed. He set it aside to assist his staff assistants, Jones, Fisher and Brumm, in collaboration of material for their own textbook on Equilibrium and Vertigo.

In 1893 Dr. Randall married Miss Emma F. Leavitt of Riverton, N. J., who still survives him, as do also two sons, Alexander B. and John L. Randall, and a daughter, Mrs. Samuel Fox, Jr.

Dr. Randall was as rare a soul in his home and social life as he was in his medical practice. He was a man of Chesterfieldian grace and culture, an artist of no mean ability, a man whose face impressed his nobility of character before a word was ever uttered. He was active in many civic organizations—at one time President of the A. M. P. O. medical fraternity—and his intimate friends and medical associates will never forget his genial sympathetic nature, generous response to every appeal and devotion to the highest ideals of his profession. Dr. and Mrs. Randall were socially prominent, but he was too busy a man to devote much time to society. He enjoyed his summer home at Blue Ridge Summit and was constantly on the golf course or tennis courts. His summers from 1903 to about 1916 were spent in the Blue Ridge Mountains with frequent trips to Gloucester, Mass., and six times across the ocean. He was a devout Episcopalian, vestryman of Christ Church Chapel. Though not a musician, he had a keen appreciation of music; he had no particular interest in politics but was always a staunch Republican.

Shortly after his graduation from Medical School in 1898, the writer became associated with Dr. Randall as assistant in the otological clinic of the University. This service was not interrupted throughout Dr. Randall's life and gave the writer an opportunity to appreciate much behind the scenes in this earnest, quiet man's life. Dr. Randall had an unusual appreciation of the ethics of medicine. While outspoken and frank against conditions he did not approve, he had the utmost charity of spirit. One occasion is recalled when Dr. Randall was reviewing a case of suppurative otitis media in consultation. The Doctor care-

fully syringed the ear, found and dislodged a forgotten fragment of cotton half concealed in the necrotic middle ear. He cautiously called this to the visiting physician's attention, but not another word to patient or friends. Time and again he was observed working patiently at the University Clinic after others had gone, in relieving some unhappy patients who really needed the time and attention of a private office.

Younger men in medicine look to older people for inspiration. Much of the inspiration of Dr. Randall resided in the keen vigorous outlook on life he maintained even in retirement from his chosen service; his sprightly step, his vigorous bearing, his keen conversation stamped him as a superior man. Those who were most closely associated with the Doctor will not forget his instant ability to discuss in full detail abstruse questions in anatomic arrangement, minute variations in operative technique, isolated pharmacopeial remedies; his fund of knowledge seemed inexhaustible and it was never ostentatious. Although conservative in his later years, this conservatism never lacked courage. It was the conservatism of experience. He was as quick to tap a spinal column and enter a cranial cavity as he was to open a middle ear, but only if his judgment so dictated. His intellectual keenness, inexhaustible memory and rare medical judgment continued until his death. In 44 years of active service, this man "lived, loved and honored his medicine."

MEMOIR OF JAMES HENDRIE LLOYD, M.D.*

By CHARLES W. BURR, M.D.

James Hendrie Lloyd, son of Enos Morris Lloyd and Julia (Hendrie) Lloyd, was born in Doylestown, Pa., December 1, 1853. He died of septic pneumonia at the Presbyterian Hospital in Philadelphia March 14, 1932. His father was an attorney-at-law. He was the fourth of a line of physicians in his mother's family, his maternal great-grandfather, grandfather, and uncle all having been medical men. He was prepared for college at Wyer's Academy, West Chester, Pa., and received from Princeton the A.B. degree in 1873 and A.M. in 1876. His instruction in college was of the old-fashioned kind, restricted to cultural subjects and giving the growing adolescent mind opportunity to absorb the old, fundamental ideas developed through the ages, in mankind's troubled and only partly successful journey toward light and learning, and also giving ingenuous youth time to find itself. Vocational training had not yet usurped the place of education. The phrase and the word were not then synonymous. Not having found himself, wanting more time to decide on his career, he studied law in his father's office for two years after graduating from college, and then, deciding that his real ambition was to be a physician, entered the medical school of the University of Pennsylvania, graduating from there in 1878. In 1879 he married Miss Susan Newell, who survives him. They had four children, three of whom are still living, Captain J. Paul Lloyd, U.S.A., W. Hendrie Lloyd of Philadelphia, and Miss Marion Lloyd.

Dr. Lloyd was elected a Fellow of this College in 1886 and to membership in the American Neurological Association in the same year, becoming its president in 1899. He was also president of the Philadelphia Neurological Society and an early member of the Philadelphia Psychiatric Society. Indeed, he was one of my strongest supporters when, at the suggestion of Dr. Albert C. Buckley, I started the movement to have a society

* Read January 9, 1933.

which would confine its attention to disorders of the mind. A few of the members of the already established Neurological Society wanted us to be content to be permitted to take charge of the program of one or two meetings of that society yearly. We were not content with this proposal and founded the Psychiatric Society, which has fulfilled its program and is, as you know, still flourishing, and shows promise of becoming still more useful. He was very active in both societies and read many papers before them. He also belonged to the county, state, and national societies.

One of his earliest medical positions was that of assistant in Dr. H. C. Wood's neurological clinic at the University of Pennsylvania, where he worked for some years. I do not know whether his acceptance of this position was from deliberate choice, or by opportunity, accident, or chance. I suspect he jumped at the chance to be associated with that genius and remarkable personality, Dr. H. C. Wood. He held many hospital positions. He was at one time a member of the consultant staff of the Wernersville State Hospital for the chronic insane, and of the Elwyn Training School for feebleminded children. He was appointed visiting neurologist to the Methodist Episcopal Hospital at the time of its foundation and served it well and faithfully for thirty-five years. He was appointed neurologist to the Philadelphia General Hospital in 1888, resigned after serving a number of years, was reappointed, and again resigned in 1925. He was for years professor of neurology in the Graduate School of Medicine.

He was editor of the *Philadelphia Medical Journal* from 1901 to 1903. He wrote a great deal on neurologic, psychiatric, and medico-legal subjects. He also wrote two very useful and interesting popular essays published in *Scribner's Magazine,* one entitled "Mental Contagion and Popular Crazes" and the other "The Incorrigible Optimist," and a very interesting psychological study of the poet, Cowper, to be published in the *Archives of Neurology and Psychiatry* in 1933. Some of his most important work in medicolegal jurisprudence appeared in the fifth edition (1905) of Wharton and Stille's "Medical Jurisprudence." His legal training, years before, fitted him peculiarly well for this kind of work. It also aided him when he appeared in court as an expert witness. His intellectual honesty and medical

knowledge made his opinion carry great weight with the court. His simplicity of language enabled juries to understand him. He never delivered, from the witness stand, loud clinical harangues, dressed in the jargon of pseudoscience, so often indulged in by a certain type of professional expert witness.

Dr. Lloyd was much more than a mere man of medicine. He did not believe in the recent American idea, that a specialist should know all about one organ of the human body and nothing about any other. He had profound contempt for the notion that the universe was divided off into separate regions, each independent of all others, and strongly believed that all things were part and parcel of one universal whole. He believed, as regards man and his diseases (a small and unimportant bit of the universe), that a specialist should first be a well-trained physician and simply devote especial attention to some one part of the body, tying it up with all the rest, remembering ever it is a unity. Furthermore, he was born with large and deep scholarly instincts, and seized every opportunity to feed his intellectual hunger. He had wide cultural interests and was one of the best read men among my friends. Medicine, to him, was not a money-making trade, but a profession that he deliberately chose, and to which he had, if I may be permitted to use a theological term, a positive call.

Lloyd, till middle life, had good health, and as he led a wholesome life and had a good machine, he lost no time from work because of illness, but then one small part of his body became ill and the result was very serious. His auditory nerve became diseased. He became totally deaf. He carried his burden uncomplainingly, and was an exception to the rule that the deaf become peevish and suspicious. He was neither. It was a handicap which prevented his attaining the position in the public eye he deserved and from getting the worldly reward received by many less deserving men, but it did not prevent him from acting as a true and upright man and fighting life's battle to the end. He was a splendid example of a high type, a type which some of us think or, at least, fear, is becoming less frequent as "demos" is growing more powerful and changing the ideals of the world.

MEMOIR OF ELMER HENDRICKS FUNK *

By THOMAS McCRAE, M.D.

Elmer Hendricks Funk was born in Philadelphia, June 23, 1886, the son of Emil C. H. Funk and Minerva Hendricks Funk. He attended the elementary schools and graduated from the high school in 1904. He then entered the Jefferson Medical College, where he graduated in 1908. Both in his preliminary education and in the medical school he took a high standing in his classes.

He had a wide experience in hospital work. After his graduation he was an interne in the Jefferson Hospital, later Chief Resident Physician and Medical Director. He served for a time as Resident Physician of the Philadelphia Hospital for Contagious Diseases. For a number of years he was an Assistant Physician to the Jefferson Hospital. When the Department for Diseases of the Chest of the Jefferson Hospital was established he was made Medical Director and Physician. In this his work was more particularly concerned with tuberculosis, but he was never a specialist in any narrow sense of the word and always held that the study and management of tuberculosis was an integral part of medicine. During all this time he was interested in general medicine, to which he turned more and more but always keeping a keen interest in tuberculosis. He was an Attending Physician to the White Haven Sanitarium. He was also on the staff of the Pennsylvania Hospital, in which he held the position of Physician at the time of his death.

His career in the Jefferson Medical College was one of steady advancement. He went through the various grades, being Clinical Professor of Medicine for some years before 1931, when, after the death of Dr. Hobart A. Hare, he was appointed to succeed him as Professor of Therapeutics and Physician to the Hospital. He excelled as a teacher and was perhaps at his best with small groups in the wards or dispensary. He always had the interests and welfare of the student in mind and nothing was trouble for him which would help a student. It was no easy task to succeed

* Read January 9, 1933.

Dr. Hare, but he threw himself into the work with enthusiasm and his first year had been a great success in every department of his teaching. He felt that therapeutics was a part of medicine and should not be kept in a separate compartment. He taught therapeutics by lectures, clinics, demonstrations and in the wards.

He was elected a Fellow of this College in 1916 and for several years had been Chairman of the Committee on Public Health and Preventive Medicine. He was elected a member of the Association of American Physicians in 1922 and had been on its Council for some years.

He was an active contributor to medical literature, many of his articles dealing with tuberculosis and pulmonary diseases. He wrote the volume on "Chronic Diseases of the Lungs," in the series of Oxford University Press Monographs, which is an excellent study of the subject. He was assistant editor of the third edition of the Osler System of Medicine, in which work I can testify to the ability which he showed not only in his knowledge of medicine but in his taste for the use of correct language. His writings always contained something worthy of being recorded. He never published for the sake of publication only; something worth while was in every article he wrote. He was greatly in demand to address medical societies and what he gave was always worthy of attention.

There have not been many men who planned their careers as carefully and systematically as he did. Too often in the eyes of the young man, the immediate advantage, if it be financial, outweighs the possibilities of the future with its chances of development and advance. Elmer Funk did not make that mistake. He laid out a plan which was to take many years with his eyes fixed on what he might achieve ten or fifteen years in the future. His objects were to become a thoroughly trained clinician, a good teacher and a well equipped worker in internal medicine. He had succeeded in all three aims. His standing elsewhere was shown by the invitations to chairs of medicine in other colleges, but he preferred to remain with his alma mater.

His work was interrupted by an attack of pulmonary tuberculosis which he met with philosophy and from which he made an excellent recovery. He did not permit it to interfere with his career, rather it did much to develop his character and gave him additional sympathy with his patients. Partly as a result

of this he became specially interested in tuberculosis work and his work in the Department for Diseases of the Chest gave him the opportunity to become a thorough master of tuberculosis and pulmonary disease. But he never took the narrow attitude so easy to acquire by the worker in a special department and always kept up his interest and studies in general medicine. He was keenly interested in the general movements concerned with tuberculosis and for many years took an active part in the work of the Pennsylvania Tuberculosis Society, being a Director from 1914 until the time of his death, and for a number of years was a member of the Executive Committee of this Society. He was a charter member of the Philadelphia Health Council and Tuberculosis Committee. In both of these societies he was an important influence.

But what will remain in the hearts of his friends and students is the memory of the man himself. Of medium height and sparely built he was always full of energy and enthusiasm. In fact his friends often felt that he sometimes needed a restraining rein but never that he required a spur. He was always cheerful; one never saw him cast down and any worries were never very long in evidence. We will long remember the twinkle in his eyes behind the glasses. After twenty years of close association with him as an assistant and later as a colleague, I can say that no man ever had a more faithful, efficient, and lovable associate. His death ended a friendship of twenty years. It had been a great satisfaction to watch his steady development and to see him "arrive" as a member of the faculty. With his death medicine lost one of her devoted sons in whose untimely passing we feel the irony of "Comes the blind Fury with the abhorred shears and slits the thin spun life" when it was reaching full fruition and the time of greatest use. The Jefferson Medical College lost one of her brilliant sons, a talented member of the faculty and one who adorned his college by the character of his work and teaching. Fortunately he had realized to some extent the results of his years of preparation and left behind him a record of a life of work well done.

He was married to Mabel Wray Buzby on May 15, 1920, who, with two children, survives him. Death came with tragic suddenness on May 13, 1932, possibly from angina pectoris or coronary artery occlusion.

MEMOIR OF ASTLEY PASTON COOPER ASHHURST, M.D.*

By LOUIS H. MUTSCHLER, MD.

On September 19, 1932, Dr. Astley Paston Cooper Ashhurst died at his home, the Coronado Apartments, 22d and Chestnut Streets, and by his passing this honorable body has lost a most brilliant and loyal Fellow.

He was elected to the College in 1906 and served actively and faithfully on many committees up to the time of his illness and his suggestions and counsel were respected.

Dr. Ashhurst was born at 2000 DeLancey Place, August 21, 1876; he was the sixth child in a family of seven children, three sons and four daughters, the latter, Mrs. Edwardes F. Leiper, Mrs. Elliston J. Perot, Miss S. W. Ashhurst and Mrs. Howard Richards surviving him. He was fortunate, indeed, in having as a father the illustrious surgeon, Dr. John Ashhurst, Jr., and as a mother Sarah Stokes Wayne, for under their wise guidance his Christian character and career were moulded. It is quite evident that his father cherished in his heart the hope that his son would follow in his footsteps and some day become a surgeon of distinction, as he named him after the renowned English surgeon, Sir Astley Paston Cooper, for whom he had the greatest respect and admiration. We can imagine how proud and happy the father would have been had he lived to know that his wish was realized and his dream had come true.

The Ashhurst family are of excellent English descent, the first to come to this country being Dr. Ashhurst's great grandfather, Richard Ashhurst, who came from Lancastershire, England, in 1801, and settled in Philadelphia. As a boy, Dr. Ashhurst was tall and thin and, though not robust, apparently was in good health. He did not participate in any athletic sports but derived great enjoyment from long country walks. He received pleasure from good music and his favorite pastime was chess, a game in which he was much interested, and a chessboard was usually to be found among his belongings when traveling.

* Read January 9, 1933.

Dr. Ashhurst received his preliminary education at the Forsythe School, a private school in Philadelphia, after leaving which he entered the College Department of the University of Pennsylvania in 1892 and was graduated with the degree of A.B. in 1896. In his sophomore and senior years he received special mention in Greek and won the Junior Latin Prize. He was elected to Phi Beta Kappa in his junior year and received several honors in his senior year.

Dr. Ashhurst entered the Medical Department of the University of Pennsylvania in the fall of 1896, and was graduated with a degree of M.D. in 1900. During his fourth year he received honorable mention in Orthopaedic Surgery and was the first man in his class. He served as an interne in the Children's Hospital of Philadelphia in 1900 and in the Episcopal Hospital from 1901 to 1903.

He was a member of the following societies: The Historical Society of Pennsylvania (since 1901); the Philadelphia County Medical Society (1904 to 1907—resigned); the Medical Association of the State of Pennsylvania (1904 to 1907—resigned); the American Medical Association (1904 to 1907—resigned); Fellow of the College of Physicians of Philadelphia (since 1906); Fellow of the Philadelphia Academy of Surgery (since 1906); the Philadelphia Pediatric Society (since 1907); Fellow of the American Academy of Medicine (since 1907); Fellow of the American Surgical Association (since 1913); Fellow of the American College of Surgeons (since 1913); Fellow of the International Society of Surgery (since 1914); the Interurban Surgical Society (since 1914); the Philadelphia Orthopaedic Club (resigned); the Academy of Natural Sciences of Philadelphia (since 1920); the Association of Military Surgeons of the United States (since 1920).

He held the following hospital positions: Surgeon to the Dispensary of the Episcopal Hospital (1904 to 1915); Assistant Surgeon to the Philadelphia Orthopaedic Hospital and Infirmary for Nervous Diseases (1904 to 1919); Assistant Surgeon to the Dispensary of the German Hospital (now the Lankenau Hospital, 1904 to 1906); Surgeon to the Dispensary of the Children's Hospital (1906 to 1911); Chief of the Gynecological Dispensary of the Pennsylvania Hospital (1906 to 1911); Associate Surgeon to the Episcopal Hospital (1913 to 1915); Surgeon to the Phila-

delphia Orthopaedic Hospital and Infirmary for Nervous Diseases (since 1914); and Surgeon to the Episcopal Hospital (since 1915).

He held the following teaching positions: Prosector to the Associate Professor of Applied Anatomy in the University of Pennsylvania (1904 to 1911); Instructor in Surgery in the University of Pennsylvania (1911 to 1920); Professor of Clinical Surgery in the Graduate School of Medicine of the University of Pennsylvania (1923 to 1932).

Dr. Ashhurst attended the Medical Officers Training Camp, at Plattsburg, N. Y., in July, 1916.

When Base Hospital Unit No. 34 was recruited from the Episcopal Hospital, Dr. Ashhurst was made its Director. The unit first mobilized at Allentown, Pa., September 7, 1917, and on November 21, 1917, was transferred to Camp Mills, Mineola, Long Island, N. Y., where it remained until it sailed for France, December 15, 1917.

Dr. Ashhurst served with distinction in the Nantes sector and was made consultant in general surgery in the hospital center of Nantes, Savenay, St. Nazaire, and Camp Hospitals at Coetquidan and Meuçon. After his return to the United States in January 1919 he was on duty as Chief of the Surgical Service in the Walter Reed General Hospital, at Washington, D. C., until his discharge from the army on April 16, 1919, at which time he received citation for "exceptionally meritorious and conspicuous service with Base Hospital No. 34."

His first commission was that of First Lieutenant M. R. C., April 28, 1918, and on May 21, 1919, he was commissioned as Colonel M. R. C.

Dr. Ashhurst was a prolific writer. Many of his surgical contributions were published in journals and he also collaborated with the late Dr. John B. Deaver in writing several monographs which were published in book form. Probably his most important work was his Text-Book on Surgery (Principles and Practice), the fourth edition of which appeared in 1931.

To those of us who knew his distinguished father, it is interesting to note how closely his son resembled him in many respects. Dr. Astley Ashhurst was tall and somewhat stooped, he had a quiet, dignified manner, and was always neat in appearance. He was an ardent student, an inveterate reader and loved the com-

panionship of his books. On the shelves of his library were to be found Latin, Greek and French volumes. Being conversant with several languages, the possessor of a wonderful vocabulary and a tenacious memory, it was an easy matter for him to write extensively, the work in which he found intense pleasure. He had lofty ideals and was always an earnest advocate of higher medical education. He strongly disapproved of the various cults, and would not only refuse to treat their adherents, but would deny them an interview. Dr. Ashhurst may have seemed antagonistic and caustic, and at times may have been considered hypercritical by some members of the profession, but his opinions and criticisms were what he held to be honest and just and he did not hesitate to express them frankly. Much of his time was spent in the surgical wards of the Episcopal Hospital, where he studied his cases most thoroughly and made accurate diagnoses. He showed a predilection for bone and orthopaedic surgery. He was fond of operating, which he did fearlessly and mastered difficult surgical problems. Punctual in all his engagements, he rarely missed an appointment

While attending church services, on Sunday, May 25, 1930, Dr. Ashhurst felt somewhat indisposed. After the service, however, he visited the Episcopal Hospital where he made his rounds, and later in the day, while driving on the Northeast Boulevard, his automobile ran into a tree. Following the accident he rode in a trolley car to his home. That same evening he became quite ill and a diagnosis of cerebral hemorrhage was made. He was obliged to discontinue active practice and forced to lead a quiet life, a severe blow, no doubt, to a man of such untiring energy and to one who had achieved prominence in his profession. Never complaining, he bore his affliction with patience and fortitude.

On July 16, 1930, Dr. Ashhurst was married to Miss Anna P. Campbell, whose love, loyalty and companionship brought much happiness into the remainder of his life and helped to alleviate the catastrophe which had befallen him.

In August, 1932, he had a second cerebral hemorrhage and developed a severe pleurisy. He had about recovered from his attack of pleurisy when he had a third cerebral hemorrhage in September and lived but a few days. He was buried in Woodlands Cemetery.

On January 5, 1933, Mrs. Ashhurst gave birth to a daughter.

Dr. Ashhurst, like his father, was a strong Episcopalian and led a true, sincere, Christian life.

The Rev. David M. Steele, Rector of St. Luke and the Epiphany, presents a striking tribute to Dr. Ashhurst's religious life and church attendance, when he says: "I knew Dr. Ashhurst intimately for all of the twenty-five years I have been rector of this parish. During that length of time he was a pewholder and a communicant and a singularly faithful attendant. He was an unusually attentive listener to my poor preaching, and oftentimes one of my wisest, though gentlest critics. It happened that he was not buried from this church; first, because of my absence in Europe at the time of his lamented death; and secondly, because his wife has been a communicant of Old Christ Church where also they had been married. He was withal a very gentle soul and underneath some brusqueness was truly a man of God."

MEMOIR OF THOMPSON SEISER WESTCOTT, M.D.*

By CHARLES H. WEBER, M.D.

Thompson Seiser Westcott was born in Philadelphia, June 11, 1862, the son of Thompson Westcott and Mary Seiser Westcott. His paternal grandparents were Charles and Hannah Davis Westcott, Charles being the son of Lewis Westcott of Bridgeton, New Jersey, to which place the family had come from England. His mother was the daughter of John Seiser, a Philadelphia merchant of German ancestry.

His father, Thompson Westcott, was a distinguished historian, the author of "A History of Philadelphia," "Life of John Fitch" and other works. He was the first editor of the *Sunday Dispatch,* the first Sunday newspaper in Philadelphia, a post he occupied for thirty-six years. He was also editor-in-chief of the Philadelphia *Inquirer.*

Dr. Westcott's early education was obtained at the Friends Central School, from which institution he entered the College department of the University of Pennsylvania. During his college years he was an outstanding scholar, and stood first in his class when he received his bachelor's degree in 1882. His extra-curricular activities were in the field of college journalism. He was editor of the *University Magazine* and one of the founders and editors of *Chaff,* the first illustrated humorous periodical published by the students of the University. For two years following his graduation he taught Latin, Greek and Mathematics at Rugby Academy in Philadelphia and while so engaged matriculated in the Medical School of the University of Pennsylvania. He was graduated Doctor of Medicine in 1886. He served as resident physician at the Hospital of the University of Pennsylvania from 1886 until 1888, and at the Pennsylvania Hospital in a similar capacity for a term of twenty months, a total interneship of almost three and a half years.

After opening an office his first private work was assisting the late Dr. W. W. Keen. This association was not due to a desire

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on his part to take up the practice of surgery, but grew from a friendship begun during Dr. Westcott's boyhood when Dr. Keen was surgeon to the Westcott family.

At this early stage in his career he decided to be an ophthalmologist, and became an assistant to Dr. Charles A. Oliver at the Wills Hospital, where later he was elected an assistant surgeon to the dispensary. Although he continued to practice ophthalmology as a specialty he still was to find his proper métier, which was determined for him through a fortuitous association with Dr. Louis Starr. Dr. Starr was the editor of the "American Textbook of Diseases of Children," and from 1890 until 1894 Dr. Westcott as assistant editor aided in the preparation of this work. From then on his interest in pediatrics increased. He was elected physician to the Medical Dispensary of the Children's Hospital and was appointed an instructor in pediatrics at the University of Pennsylvania. In 1894 he was elected to the medical staff of the Methodist Hospital and also served as pediatrist to that institution. He was elected a Fellow of this College in 1893 and was chairman of the Committee of Publication for some years. He was a member of the American Pediatric Society and a former president of the Philadelphia Pediatric Society.

In 1893 he married Marie Louise Repplier, who with three daughters survives him.

His writings were not extensive, but one monograph, "The Scientific Modification of Milk," gained for him widespread recognition and was considered at the time an authoritative presentation. This paper came at a period when, emerging from the empirical methods of infant feeding by the obstetrician and general practitioner, we were becoming conscious of the chemical constituents of cow's milk and the practicability of its scientific modification. He entered this new field with tremendous enthusiasm and as a former teacher of mathematics he elaborated his papers with many strange formulae with which he decorated the blackboard to the confusion of his audience at society meetings and to the horror of his students in the class-room.

Dr. Westcott was a kinsman of mine and my preceptor during my student days, an office considered very necessary at that time by the Medical School. This association begun then continued without interruption until his death. It is difficult to appraise the character of a companion with whom one has been so intimate.

Many characteristics that one might subject to analytic criticism in a stranger have become so familiar that one hardly notes them. But to everyone, stranger or intimate, his charm of manner and gentleness were apparent. Without guile or pretense himself he believed implicitly in his fellow men, often to the point of naiveté. Tolerant and generous-minded he was always friendly and displayed a sociableness which was never disturbed by moods. He had no hobbies, unless a love for the theatre can be so considered. Not the professional performance necessarily, for any amateur presentation was sufficient to entertain him, however badly it was done. He was fond of music and the opera. He played no games and never took a real vacation.

In his professional work he was primarily a clinician. Painstaking and methodical, he was consequently thorough. As a result of the teaching he had received from an older school he believed that the training of the special senses for the purpose of diagnosis was a sine qua non. He dwelt upon symptomatic minutiae, the laboratory and other diagnostic aids being given a secondary and confirmatory position. In spite of his conservatism, however, he accepted and practiced the newest scientific methods in diagnosis and therapeusis, especially those pertaining to preventive medicine.

With a rare disregard for his own comforts and conveniences his time was entirely at the disposal of his patients. Hence routine became irregularity, but no patient ever suffered from neglect.

On one occasion some years ago before the day of the motor car he was called at night to the Methodist Hospital to see a sick child, a patient in the public ward. After returning home and retiring he became uneasy lest he had neglected something. He dressed, and in the middle of the night made his way back to the hospital and to the bedside of the little patient in the ward. This is only one incident of many of which I have personal knowledge, but it tells a story, a story of a conscientious and unselfish doctor.

He died on January 28, 1933, from uremia, after an illness of one month.

MEMOIR OF G. ORAM RING, M.D.*

By SAMUEL HORTON BROWN, M.D.

The privilege of presenting to the Fellows a memoir concerning a departed member, who has cast no little distinction upon the Society, is an honor that calls for considerable care in the preparation of the record and demands accuracy in statement, since for many this is the final resumé of their accomplishments in this troublesome life. The influence of Dr. G. Oram Ring will be an exception and will doubtless be lasting, built, as it were, upon a foundation of kindness and good fellowship, qualities sufficiently rare to make their possessor outstanding throughout all generations.

Gassoway Oram Ring was born in Roxborough, Philadelphia, August 6, 1861, the son of David and Mary (Price) Ring. On his father's side he was a direct descendant of John Ingram, a noted landowner of Yorkshire, England, and through his mother's side traced his descent from the Price family, original pioneers and settlers in that part of Maryland that was to become Baltimore. His early education was received in the public schools and he was graduated from the Central High School of Philadelphia in 1881 with the degree of A.B. He was a brilliant student and attained consistently high marks in all his studies. While his desire to study medicine was dominant, for a short period he attended a business college. His parents were desirous that he enter the old established and prosperous business firm of David and William Ring, wool and yarn manufacturers of Philadelphia, which accounts for a two-year interval between his graduation from the Central High School and his matriculation in the Medical Department of the University of Pennsylvania. In deference to his mother's wishes he followed a business career in this interval, supplemented by the study of music, and particularly of the organ, in which field he attained considerable local reputation as an accompanist to some of the well-known vocalists of

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the city. His industry, even at this early period of his career, was especially noteworthy.

His undergraduate work at the University of Pennsylvania was highly creditable and in his final examinations attained marks over 95. He received his M.D. at the University in 1885 and was licensed to practice in Pennsylvania in 1885. He is said to have served the customary interneship in one of the local hospitals, but inquiry directed towards most of them fails to confirm this statement. He appears to have embarked in general practice up-town rather shortly after his graduation which disposes of the possibility of his having served as a resident physician in any of the hospitals. Early in his career, he became interested in ophthalmology and became affiliated with Dr. Wm. F. Norris and his associates at the University, a group including de Schweinitz, Wallace, Randall, John T. Carpenter, Jr., and Risley, all of whom were destined to occupy prominent positions in this field. He was Assistant in the Eye Department of the University from 1885 to 1889.

He became Assistant Surgeon to the Wills Hospital in 1891 and served in that capacity for two years. He became a member of The Philadelphia County Medical Society, March 21, 1888, which automatically gave him membership in the Pennsylvania State Medical Society and the American Medical Association. In 1895 he was elected a Fellow of the College of Physicians and later (1920–1921) became chairman of its Section on Ophthalmology. His election to the American Ophthalmological Society in 1901 definitely assured him the status of an ophthalmologist of the first class. He was at one time a member of the Pathological Society of Philadelphia. While he was not certified by the American Board of Ophthalmic Examinations until 1922 he became an active member of the examining board a short time later.

Doctor Ring's serious affiliation with ophthalmology began a few years after his graduation from the medical school and his general practice was gradually eliminated. He went abroad in 1886 and again in 1891 with the purpose of improving himself in this subject, and subsequently made almost yearly pilgrimages to the various ophthalmic clinics of Europe. His progress in ophthalmology from the time of his original affiliation with Doctor Norris at the University was quite rapid and he became Ophthal-

mic Surgeon to the Episcopal Hospital in December 1890 succeeding Doctor Randall, who resigned October 1890. The enormous clinical service at this hospital afforded him ample opportunities for the application of the knowledge he had gained here and abroad. Subsequently he became affiliated with the Samaritan Hospital. He also became Consulting Ophthalmologist to the American Hospital for Diseases of the Stomach, the American Oncological Hospital, and the Widener Memorial Hospital for Crippled Children.

Doctor Ring wrote and presented a number of papers upon clinical ophthalmology as well as reviews of his experiences in the foreign clinics. He attended that of Professor Heinrich Streuli in Berne, Switzerland, when that individual was demonstrating the slit-lamp, in the very early days of that wonder instrument. The elder Fuchs attracted him and he attended his clinics quite frequently. When post-war conditions imperiled the living conditions of that grand old man of ophthalmology, Doctor Ring joined with Dr. de Schweinitz and other prominent American ophthalmologists in arranging classes in this country for him, which were very successful financially as well as otherwise.

In the college fraternity world, Doctor Ring was affiliated with Phi Delta Theta and Alpha Mu Pi Omega (both of the University of Pennsylvania). In politics he was a Republican, in religion a Presbyterian.

He was a member of the Union League of Philadelphia and of the Medical Club of Philadelphia, of which latter organization he was President in 1919. During the administration of Governor Sproul of Pennsylvania, he was appointed a member of the Commission to investigate Compulsory Health Insurance.

Dr. G. Oram Ring married Elizabeth P. Glendenning of Philadelphia, May 11, 1893, a writer of verse, by whom he is survived. At the outbreak of the world war Dr. and Mrs. Ring were in the south of France and were compelled to take refuge on a gunboat on which they were taken to Genoa, from which place they were returned to this country on an American naval training-ship.

Not only was Doctor Ring a traveller abroad but also in his own country. Fishing in the Florida waters was especially attractive to him. On a visit, as a guest, to the Izaak Walton Club, Usseppa Island, Charlotte Harbor, Florida in June 1929, he was awarded the gold button for catching a tarpon weighing over one

hundred pounds, and a silver button for catching his first tarpon at this place. (Unlike so many fishermen, his strong character survived this demoralizing experience.)

Doctor Ring's personality like his stature (he was 6 feet 3 inches tall) towered above his outstanding accomplishments. Complete satisfaction in his devotion to his vocation impelled him to radiate kindness and consideration for those with whom he came in contact. As a consequence, his extreme friendliness and cordiality will long be remembered.

Doctor Ring succumbed to cerebral hemorrhage January 17, 1933, after a useful and inspiring life. He was interred in Lawndale Cemetery, Philadelphia, January 20, 1933.

MEMOIR OF GEORGE FETTEROLF, A.B., M.D., Sc.D.*

By George B. Wood, M.D.

By the death of George Fetterolf, Philadelphia medicine has lost one of its leading laryngologists; the College of Physicians a loyal and honored Fellow and we his friends a sympathetic and genial companion. Although for the past year or more he had not been in good health and during the fall of 1932 was unable to carry on active practice, his death from cerebral thrombosis on December 29, 1932 was sudden and a great shock both to his friends and to the medical profession.

He is survived by his widow, Mrs. Lila Prosser Fetterolf, and a brother, Mr. Edwin H. Fetterolf. There were no children.

Dr. Fetterolf was born in Collegeville, Montgomery County, Pa., on March 31, 1869. His father was Adam H. Fetterolf, A.M., Ph.D., and his mother, Annie H. Fetterolf. For a while his father conducted a private school for boys at Andalusia near Philadelphia and here Dr. Fetterolf received his early education. His mother died in 1877. In 1880 his father was elected Vice President of Girard College, Philadelphia, and President in 1883.

Dr. Fetterolf prepared for college at the Episcopal Academy in Philadelphia. He matured rapidly and was a brilliant scholar, entering college at fourteen years of age. From childhood his ambition was always to study medicine. He graduated from the College Department of the University of Pennsylvania in 1887. As a preparation for his medical studies he spent the next year as demonstrator of histology and embryology in the Biological School at the University of Pennsylvania. Entering the Medical Department in 1888, he graduated in 1891.

His interneship was spent at St. Luke's Hospital, Bethlehem, Pa. He early attached himself to the Anatomical Department at the University of Pennsylvania and became Prosector in Applied Anatomy in 1893. He advanced through the various offices connected with the Anatomical Department, teaching in the dis-

* Read May 8, 1933.

secting room and writing numerous anatomical articles and in 1912 was made Assistant Professor of Anatomy, which office he held until 1921. This association with the Anatomical Department gave him his profound knowledge of anatomy which stood him in such good stead in his chosen specialty of otolaryngology.

In "Famous Men Who Have Held the Chair of Anatomy," by George E. de Schweinitz, published in the *Pennsylvania Gazette,* January 28, 1927, we find the following passage:

"It is only necessary to mention a few of these men whose surgical and operative ability were so largely the outcome of their anatomical studies and dissecting room experiences: William Hunt, D. Hayes Agnew, Charles Hunter, Charles B. Nancrede, H. Lenox Hodge, John B. Deaver, Richard Harte and George Fetterolf."

As soon as he had finished his interneship at St. Luke's Hospital he began to specialize in otolaryngology, though for years a large part of his time was taken up with his duties in the Anatomical Department of the University. He studied under Dr. Arthur Ames Bliss and was for a while assistant to Dr. D. Braden Kyle. His early clinical experience was gained at the Philadelphia Polyclinic where he was Assistant Laryngologist until 1896. After this and up to 1906 he was Assistant Laryngologist to the Methodist Episcopal Hospital of Philadelphia. His training in laryngeal tuberculosis was obtained at the Henry Phipps Institute to which he was elected Laryngologist in 1905, and in 1906 was appointed Laryngologist to the Whitehaven Sanitarium. As a consulting laryngologist he served on the staffs of the Eagleville Sanitarium, the Phoenixville Hospital, the Eastern Pennsylvania Institute for Feeble Minded and Epileptic, the Kensington Hospital and Dispensary for Tuberculosis and the Shriner's Hospital of Philadelphia. Ursinus College gave him the honorary degree of Sc.D. in 1911.

In 1924 he was elected Professor of Otolaryngology at the University of Pennsylvania. Previous to his election there were two separate chairs of Otology and Laryngology and when the authorities at the University of Pennsylvania decided to unify these two chairs they selected George Fetterolf as preeminently fitted to take charge of this department, and the subsequent development of this department more than justified their selection.

Dr. Fetterolf belonged to the Beta Theta Pi College Fraternity, the Phi Alpha Sigma Medical Fraternity, the Alpha Omega Alpha (Honorary Medical Society), the Theta Nu Epsilon Sophomore Society and Lodge 51 of the Free and Accepted Masons. In 1910 he was elected to the Sigma Xi Society. The 1929 "Scope," a year book published by the graduating medical class at the University of Pennsylvania, was dedicated to him. This was an honor that he appreciated very greatly.

For many years he was a member of the Union League of Philadelphia and, for even a longer time, of the Art Club. Also, he was a member of the Merion Cricket Club where his golfing enthusiasm found its chief outlet. His membership in the Swiftwater Preserve, a trout fishing club in the Pocono Mountains, was one of his greatest joys.

His professional society memberships included: the American Association of Anatomists, the American Laryngological, Rhinological and Otological Society, the American Medical Association and its associated State and County societies, the Philadelphia Pathological Society, the John Morgan Society. He was more interested in the American Laryngological Association than any other professional society of which he was a member. He served on the Committee on Tonsil Investigation in that Association from 1918 to 1923 and was its chairman for the last two of these years. He was Treasurer from 1923 until his election as President in 1932.

He was elected a Fellow in the College of Physicians in 1907. His most active interests as a Fellow of the College were centered around the Mütter Museum. He was appointed a member of this Committee in 1913 and up to his resignation in 1924 gave much of his time and thought to the proper display of the old and to the acquisition of new exhibits. During his tenure of office as chairman he was instrumental in obtaining for the Museum the Chevalier Jackson Collection, the Cryer Collection, the Frazer Collection of slides of Anatomy and Pathology of the Ear and also in the installation of new exhibition cases, which have added much to the attractiveness of the Museum.

He also took a large part in increasing the activity of the Section on Otology and Laryngology. He was its chairman for 1923 and 1924 and served on its Executive Committee for many years.

He was a member of the Council of the College from 1927 to 1929.

During the World War he was commissioned Major in the Medical Corps of the Army on May 21, 1918, and served as Chief of the Department of Otolaryngology first at Camp Sevier and later at Camp Hancock. He received his discharge on February 12, 1919.

In reviewing Dr. Fetterolf's contributions to medical literature we are impressed not only by the meticulous care in the collection of material and preparation of data, but also by the unusually clear presentation of facts and the detail of his published articles. Some of his most important anatomical contributions were based on the use of carefully made frozen sections through the body to demonstrate the relation of the various organs of the chest both in normal and pathologic conditions. Many of these articles were written in collaboration with such distinguished clinicians as H. R. M. Landis, George William Norris and J. Claxton Gittings, and their value depended upon the furnishing of an anatomical explanation of certain well known clinical phenomena. For example, "The Anatomic Explanation of the Greater Amount of Vocal Fremitus and Vocal Resonance Normally Found at the Apex of the Right Lung," again, "Some Anatomic Features of the Child's Thorax and Their Practical Application in Physical Diagnosis," and "The Anatomical Explanation of the Paralysis of the Left Recurrent Laryngeal Nerve Found in Certain Cases of Mitral Stenosis." It was probably the excellence of these studies that first brought the value of the man to the attention of Philadelphia medicine.

His writings on otolaryngology showed the same careful preparation and planning. His article on "The Anatomy and Relations of the Tonsil in the Hardened Body, etc.," has been quoted in many of our American textbooks. "The Reaction of the Paratonsillar Tissues to Tonsillectomy: A Study in the Etiology of Posttonsillectomy Pulmonary Abscess," written in collaboration with Dr. Herbert Fox, was awarded the Casselberry Prize of the American Laryngological Association in 1923. This was an important contribution to the etiology of pulmonary abscess and as such has received wide recognition. He published several articles on laryngeal tuberculosis and was an advocate of the importance of the galvano-cautery in the treatment of this

disease. He was one of the first, if not the first, among laryngologists to use ephedrine, and his published clinical experiences with this drug brought its importance to the attention of other laryngologists. His study of vagotonia and the relation of the upper respiratory tract to bronchial asthma were real contributions to laryngology.

In the reorganization of the editorial staff of the *Annals of Otology, Rhinology and Laryngology,* he was put on the editorial board and in 1929 was elected by the trustees of the American Medical Association as a member of the editorial board of the *Archives of Otolaryngology.*

Although Dr. Fetterolf was not a prolific writer and wrote only when he had something to say, his publications, based on carefully worked out data and written in a clear and convincing manner, have truly added to the sum of medical knowledge.

Dr. Fetterolf owed his success in the field of otolaryngology not to unusual opportunities but to his own personal ability. He had a rather remarkable manual dexterity and his gentleness of manipulation was a source of much satisfaction to his office patients. In his operative work he combined this technical skill and accurate knowledge of anatomy with the cautiousness of a conservative temperament. He was not a radical enthusiast, preferring to avoid major surgery when such could be avoided, but willing and able to do major surgery when it was indicated. His attention to details and an intense realization of his responsibility for the individual patient made him avoid many of the so-called accidents that happen to some of us who perhaps at times take too much for granted.

He was never jealous of the success of others, but accepted with apparent pleasure improvements in technique or new ideas that came to him through contact with those whose opinions he respected. This, with him, was not an evidence of vacillation or lack of conviction. It was necessary to convince his really intellectual grasp of any proposition, but when once convinced it became a pleasure for him to act on that conviction. He was generous in granting to others credit for achievement and had a singularly happy manner of expressing his approval.

He excelled as a teacher, possessing an orderly mind and an unusual ability to express his thoughts. He was, in his earlier days, one of the most popular and efficient instructors in anatomy

that the University of Pennsylvania has ever had. When elected Professor of Otolaryngology he not only stood out as a teacher, both in the clinic and on the platform, but also showed a rather unusual ability as an organizer.

He associated with himself an especially earnest and efficient group of assistants which, coupled with his careful and detailed planning, made it possible for the work of otolaryngology at the University to be carried on smoothly and efficiently even when his increasing poor health of the last year or so necessitated frequent absences.

In 1903 Dr. Fetterolf married Miss Eleanor R. Walter of Penn Yann, New York. They were divorced in 1913. In 1915 he married Miss Lila C. Prosser, daughter of Dr. W. O. Prosser of Eugene, Oregon, a graduate of McGill University and at one time house physician to Sir Morell Mackenzie.

For his friends Dr. Fetterolf had a sympathy and understanding that made confidences natural. His apt and terse remarks about things and persons were at times perfectly delightful and his frankness often became contagious.

All his life he was exceedingly fond of music. From his college days when he led the banjo club and throughout the years of grand opera and symphony orchestra, music was to him not only an enjoyment but almost a passion.

His literary tastes were evidenced by the completeness of his library and the collection of many first editions, and his artistic appreciation by a complete set of Bishop's etchings.

His adaptability to the moods of others, his wide reading and his interest in art and music, and above all his delicious sense of humor made him a most pleasing companion. He was one of those rather rare conversationalists who stimulated but did not dominate. One might become provoked or even angry with him, but never bored.

He enjoyed the great out of doors. He played a good game of golf but in his later years found his greatest relaxation in the wilder places. For years, he went regularly to the woods of Maine and, like all good fishermen, thrilled over new tackle and appurtenances.

As the fall of the great tree leaves an open scar in the forest, so the passing of George Fetterolf leaves a vacany in the ranks of laryngologists and a lasting emptiness in the hearts of his friends.

MEMOIR OF WILLIAM WILLIAMS KEEN, M.D.*

By WILLIAM J. TAYLOR, M.D.

Dr. William Williams Keen was a descendant of Joran Kyn, an original Swedish settler in Chester, Pa., the child of William W. and Susan Budd Keen, and was born in Philadelphia on January 19, 1837.

He was educated at the Central High School and at Saunders Academy and entered Brown University at the age of eighteen, where he graduated in 1859. At that time Brown University had about 200 students, with a faculty of ten. He remained at Brown University for five years, an extra year to prepare for his medical studies, and he entered the Jefferson Medical College in 1860.

When the Civil War broke out, Dr. John H. Brinton was asked to select a surgeon for the Fifth Massachusetts Regiment, and he selected Dr. Keen when he had been less than ten months in the Medical School. Objection was made by Dr. Keen that he had not had training sufficient to qualify him for the position, but Dr. Brinton answered "That is true, you know very little, but on the other hand you know a good deal more than Smith."

In July, 1861, he was sent to a camp at Alexandria and two weeks later was at the battle of Bull Run, where the wholly unorganized condition of the Medical Department was such that he did not receive a single order from any one. He tells an interesting story indicative of the general ignorance of the surgeons at that time: "One of the wounded required an amputation at the shoulder joint, and the operator asked the brigade surgeon to compress the subclavian artery. This he proceeded to do by vigorous pressure applied below the clavicle. With a good deal of hesitation, I at last timidly suggested to him that possibly compression above the clavicle would be more efficacious, when with withering scorn he informed me that he was pressing in the right place as was proved by the name of the artery, which

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was subclavian. I had my rather grim revenge, happily not to the serious disadvantage of the patient. When the operator made the internal flap, the axillary artery gave one enormous jet of blood, for the subclavian persisted in running where it could be compressed above the clavicle, in spite of its name. I caught the artery in the flap, as I had been taught to do by Dr. Brinton, and instantly controlled the hemorrhage."

Soon after this battle, the period of enlistment in his regiment expired, and Dr. Keen was discharged and returned to Jefferson Medical College to complete the prescribed course for his degree in medicine. Two months later he was commissioned as Acting Assistant Surgeon in the U. S. Army, and put in charge of the Eckington General Hospital in Washington; after that he was in charge of a hospital at Frederick, Md., later ordered to the Satterlee Hospital in Philadelphia, in 1863 to the Christian Street Hospital, then served with Weir Mitchell and Moorehouse in the Turner Lane Army Hospital in their study upon the injuries of the nerves, and was joint author with Weir Mitchell and Moorehouse in their valuable monograph "Gun Shot Wounds and Other Injuries of Nerves"; here began his early interest in neurological surgery.

He passed two years, 1864 to 1866, in post-graduate study in Europe, in Paris and in Virchow's Laboratory in Berlin; on his return to Philadelphia in 1866, he was engaged to teach surgical pathology in Jefferson Medical College. Shortly after this he became the active head in the Philadelphia School of Anatomy until it was dissolved in 1875. Here he was associated with Dr. J. M. DaCosta and Dr. John H. Brinton and with Dr. Weir Mitchell. At that time courses in medicine in the Medical Schools were limited to two short terms of didactic lectures and most, if not all, clinical teaching was done in the extramural schools.

Dr. Keen taught descriptive, surgical and artistic anatomy, as well as giving courses in operative surgery, and later was made Professor of Artistic Anatomy in the Pennsylvania Academy of Fine Arts. He was always very much interested in neurological surgery and in 1887 he operated at St. Mary's Hospital on a patient with an accurately located tumor of the brain, a fibroma of the dura, at which I had the privilege of assisting him. This was the first brain tumor successfully removed in America, and the patient lived for 30 years. He was much interested in opera-

tions for focal epilepsy, for microcephaly, was probably the first to deliberately drain the ventricles, and was among the earlier operators who removed the Gasserian ganglion for tic douloureux.

He originated very many valuable procedures in the surgery of the brain and was the first, I believe, to do a decompression of the skull; besides this he devised an electrode for locating the motor centers in the brain, and various special instruments.

He was made Professor of Surgery in the Woman's Medical College, 1884, and on the death of the younger Gross, succeeded him as Professor of Surgery in Jefferson Medical College, and retained this position until 1907, when he retired from active practice.

He was a most remarkable surgical teacher, and was described by Dr. J. Chalmers DaCosta, who succeeded him in the Chair of Surgery at the Jefferson Medical College: "As a teacher I never heard him excelled. He had that combination of earnestness and clearness that was absolutely convincing of his own beliefs. I never heard him teach a fad in my life. I never heard him teach any of those fanciful things that are so common; and as an operator, it is needless to say, he was a master. He always showed best when the situation was worst. Dr. Keen was always calmer, quieter, kinder, pleasanter, the worse the surgical situation was, and I never saw it get the best of him. He had a favorite expression when he would finally get hold of the situation and control the hemorrhage. He would say, 'Now we have the whip-hand of it.' It passed into a proverbial expression in the Jefferson Medical College."

He was the first in Philadelphia to practice Lister's method of antiseptic surgery, beginning its use at St. Mary's Hospital.

His clinics were crowded, not only by students, but by visiting surgeons from all over the United States and from many foreign countries. He was a most prolific writer on surgical and anatomical subjects; he edited Gray's Anatomy in 1883 and a second edition some years later, Flower's Diagram of Nerves, and the works of many others. In 1892, with J. Wm. White, he published the American Text Book of Surgery which went through two editions, and later "A System of Surgery" in 8 volumes.

He had many honors showered upon him by societies of our own country, having been president of the American Surgical Association, the American Medical Association, the Philadelphia

Academy of Surgery, the College of Physicians and the American Philosophical Society. In Europe he was equally well known, and was an associate member of the Academy of Medicine of Paris, honorary member of the Society of Surgery of Belgium, honorary fellow of the Royal Society of Medicine of London, and was president of the International Society of Surgery in 1920 and presided at the meeting in Paris in 1923. He was given a degree by St. Andrew's University, a Doctor Honoris Causa of the University of Paris, the sixth American to be so honored, and he was given honorary degrees without number, Doctor of Law, Doctor of Science, honorary member of the Royal College of Surgeons of England, Edinburgh and Ireland; decorated in Belgium with the Order of Leopold; by the President of the French Republic was made an officer of the Legion of Honor; and was honored by our own Government for his services in the Civil War and in the Great War.

He was recognized throughout the civilized world as a foremost anatomist and teacher in surgery. As Dr. Franklin H. Martin stated in his Memoir: "He was a great man, a great American, a great surgeon and the beloved Dean of our medical profession."

Dr. Keen in speaking to a group of graduates said: "If in your own life you realize the characteristics of the ideal physician, if you attain to old age, when the hairs whiten and the crow's feet begin to show, when your natural forces are abated, you will then not be alone in the world, but will have honor, love, obedience, troops of friends, and a Friend above all others, the Great Physician."

His devotion and loyalty to this College were well known, and his many benefactions have been unending. He was elected a Fellow in 1867 and was, at the time of his death, its senior Fellow. He was elected President in 1900 and 1901, but did not serve the usual third year, because he left in June for a trip around the world.

He was elected a censor and as such was a member of the Council but, owing to his very great age, had of late years attended few meetings of the College and Council, except occasionally when he had some special business to bring to its attention.

When elected President, there were few endowments for library purposes, and he worked industriously for additional en-

dowments, finally succeeding in raising $60,000—$5000 of which he gave himself. He succeeded also in collecting $1000, begged from friends and subscribing very liberally himself, and brought home from Italy twenty-five incunabula and other rare books for the library.

He received the degree of LL.D. from Brown University, Northwestern University, University of Toronto, Edinburgh, Yale, Upsala, and the University of Pennsylvania, and was an Honorary Fellow of the Royal College of Surgeons of England, Edinburgh and Ireland.

He was the first recipient of the Carver-Rosenberger Medal of Honor awarded by the Faculty of Brown University, of which he was a trustee, "For notable and beneficial achievements." He served as a medical officer in the Civil War and in the Great War; his services were declined as not needed in the Spanish-American War. He was a member of the Founders and Patriots of America, of the Loyal Legion, and of the Medical Veterans of the World War. He assisted Dr. John D. Bryant in operating upon President Cleveland, when the upper jaw bone was removed for cancer. This was during the fight in Congress over the silver question in 1893, and the greatest secrecy was necessary to keep the news from precipitating a financial panic. This operation was so successful that President Cleveland lived for fifteen years in comfort.

Dr. Keen was the most active man, both mentally and physically, I have ever known. I have never seen him tired and his great relaxation was to turn from writing some profound surgical paper, to become deeply absorbed in a controversy with anti-vivisectionists, and from this again to preparing a history of the Baptist Church.

He spoke French and German fluently and was a great traveler. On his retirement from practice, he spent nearly a year in a voyage around the world, visiting many unusual places, Russia, Hawaii, Japan, Korea, China, India—where he fell off an elephant and fractured his clavicle—Egypt, Greece, and Palestine. In all these countries visited, including Persia, he found former students eager to meet and do honor to their old teacher.

He was deeply religious, a regular attendant at the First Baptist Church, of which he was a deacon.

It was a pleasure to work with him and for him. He never spared himself, expected and demanded hard work from his assistants, but was just and considerate and never demanded the impossible. He was most punctual in keeping his appointments, and if he said he would be at a certain place, he would arrive on the exact minute.

He was an ardent prohibitionist and in all his forty-odd years of our intimate association I have known him only once to take one glass of beer.

In my earlier association with him, he carried on a large general practice in addition to his surgical work and it was not until this became too engrossing that he devoted himself entirely to operative work.

His death on June 7, 1932, was a deep personal sorrow. My own association with him lasted for over forty years, first as his chief assistant in all of his private practice and much of his hospital operative work, and I shall be forever grateful for the instruction given me and for his never-failing kindness to me. Our friendship continued all these years without a ripple of unpleasantness and I can truthfully say that he never spoke a cross word to me nor was there ever a serious disagreement, although we did not always agree in minor matters.

It was my privilege to attend him professionally during his last illness. The world is a better place for his having been here and the impression which he leaves upon the medical profession of the whole country will last for all time.

NECROLOGICAL LIST

Fellows

DR. JOHN SPEESE ..... October 15, 1933
DR. WILLIAM A. EDWARDS ..... November 15, 1933
DR. HENRY F. PAGE ..... December 21, 1933

MEMOIR OF DR. JOHN CHALMERS DACOSTA *

By THOMAS A. SHALLOW, M.D.

Dr. John Chalmers DaCosta was one of Jefferson's immortals. He was born in Washington, D.C., on November 16, 1863. His mother, née Margaret Beasley, resided in the capital city in order to be near her husband, George T. DaCosta, who, at that time, was a private in the Army of the Potomac under General George B. McClellan.

After the Civil War, the DaCosta family made its home at the foot of a mountain near Orange, N. J. Here, in a beautifully situated country place, they lived for several years.

Regarding the origin of the DaCosta family, interesting information is found in the writings of Mr. and Mrs. S. Rappaport, Russian authors and linguists. A young Count DeCosta fell in love with a beauitful, well-educated and accomplished daughter of a Prince of Israel of great wealth. This young Jewess was as proud of her lineage as Count DeCosta was of his own. The young man, wishing to marry this talented young woman begged permission from his King, through the Prime Minister, but was refused. The young count then appealed to His Majesty, Phillip II of Spain, in person. When the King indignantly rejected his plea, the young couple married in spite of the royal objection and were banished from Spain. The King was implored to forgive the erring couple but remained adamant in his refusal, confiscating part of the estate and declaring young Count DeCosta dead. DeCosta and his wife then moved to Portugal, where the rich and powerful "DaCosta" family had its origin.

It is not from this branch of the DaCostas that the subject of this memorial is derived. The second son, who remained in Spain, is the ancestor of John Chalmers DaCosta, recently professor of Surgery in The Jefferson Medical College. From the time of Phillip II (1527 to 1598) until about 1690, little, if anything, is known of the fortunes of the House of DeCosta. The first American settler of the family was Isaac DeCosta, who emi-

* Read January 8, 1934.

grated from England and landed in Boston in 1690. Six years later he married Mary Temple. From this union, ultimately, came the subject of this memoir. Much could be said of the members of this family who were well-to-do and highly respected citizens of Boston. Some of them served with distinction during the American Revolution. Joseph DeCosta, a great-uncle of the late Professor of Surgery, served in both the Militia and the Continental forces. From the records of the "Soldiers and Sailors of the American Revolution," we learn that he enlisted as a private, was promoted to corporal and, finally, became a sergeant. From the Boston Commissioner's records we glean the interesting fact, perhaps illustrative of hereditary tendencies, that Joseph DaCosta was elected to Fire Engine Company No. 7 of Boston.

Following the American Revolution, Joseph DaCosta, a sea captain, married Ann Tallman in Christ Church, Philadelphia, in 1794. Ann Tallman's maternal grandfather was Alexander Chalmers, a native of Perth, Scotland, and her paternal grandfather was George Tallman, born in Frankfort-on-Main, Germany. From this time on the names of Chalmers and Tallman appear in every generation.

The childhood days of Dr. DaCosta were those of affluence and joy. His father was the president of the Camden and Atlantic Railroad. His mother always remained in DaCosta's memory as one of his sacred recollections. It is to his mother that he credits his literary talent. The kind patience and loving spirit of his mother controlled the tantrums of his youth. He never spoke of his mother in after years without tears in his eyes. His boyhood days were spent partly in Philadelphia at their home at 334 North Front Street and partly at Cloverdale Farm, midway between Camden and Haddonfield, New Jersey. The country home was bordered by Newton Creek. Here, DaCosta swam, rode and fished in good weather and on rainy days, in company with his brother, George, and his cousins, Edwin, Emma and Kate DeHaven, amused himself in a gymnasium constructed in the barn. At the age of eight, having been instructed by his mother, DaCosta was familiar with the history of England at the time of Queen Elizabeth. At this early age, he recited "The Charge of the Light Brigade" and "Sheridan's Ride" for the amusement of the family and his friends.

An unfortunate accident occurred in DaCosta's life. At the age of nine he was struck in the eye by a pine cone. This ultimately resulted in the loss of his right eye. It was during the period following the injury to his eye that he first became interested in medicine and in surgery. He would construct instruments from his mother's hairpins similar to those he had observed in Dr. Strawbridge's office.

Because of this injury, he was more or less spoiled by his family and frequently would disappear for hours; and, sometimes, even for a whole day. On numerous of these occasions of A. W. O. L., he would hide himself on a locomotive and ride to Atlantic City. His friendship for railroad-men dates from these early days, and his pleasure in riding on locomotives continued until he became crippled. I have often seen Dr. DaCosta climb into the cab of the 5:10 express pulling out of Camden for Atlantic City. He usually occupied the fireman's seat through the whole journey. When he was twelve years old his uncle and his father were members of the Volunteer Fire Departments of Haddonfield and Philadelphia. Their interests were absorbed by young DaCosta, so that, in after years, he was always intimately associated with the Philadelphia Fire Department—another of his hobbies. He rode with Chief Baxter and Chief Waters to all three-alarm fires. He served as physician to the Firemen's Pension Fund for more than twenty-five years without salary. Indeed, during the same night in which he had refused to see a private patient, he would hasten to the side of an injured fireman.

When DaCosta was fifteen, the family moved from the Front Street house and took up their residence on Delancey Street between 23d and 24th Streets. At this time, DaCosta, through the influence of a medical student, became the posssessor of a skull and bought, at the book store at 6th and Walnut Streets, two volumes of Horner's Anatomy. Thereafter, his interest in medicine was well established. His father, however, desired him to enter the legal profession. He did not look kindly on DaCosta's ambition. DaCosta entered the University of Pennsylvania at the age of 17, having received his preliminary education at Friends' Central and Brown Preparatory Schools. At the University of Pennsylvania he took up the science course and majored in chemistry. During these college days, however, much of his time was spent in the old amphitheatre at Blockley, watching the elder Gross,

Agnew and Pancoast perform operations. Before completing his college course at the University, his father died and young DaCosta's reversals began. He left the University and entered the Jefferson Medical College in the year 1882. He was then 19 years old. He graduated from Jefferson in 1885 and became a resident physician in the Old Blockley Asylum. At the completion of his internship at the Philadelphia Hospital, he became associated with Dr. Charles Potts and Dr. J. Montgomery Baldy. The friendship between Potts and DaCosta persisted until Dr. Potts' death. To reproduce, here, the reminiscences that I have heard Dr. DaCosta and Dr. Potts indulge in would be to introduce an illuminating chapter withheld by Dr. DaCosta from his essay on "Old Blockley." Certainly, at Blockley, all of Dr. DaCosta's time was not spent in the pursuit of medical lore!

At the completion of his internship, he accepted a position as assistant physician to the Insane Department of the Philadelphia General Hospital. Here the groundwork was laid for Dr. DaCosta's extensive knowledge of neurology and psychiatry which made him an outstanding teacher in this branch of surgery. His days in the Insane Department of the Philadelphia General Hospital were depressing ones. His sympathetic nature and his desire to help everyone frequently caused trouble between him and the authorities. After a series of particularly doleful events and during a wild, tempestuous night, one of the patients committed suicide by hanging. With the wind outside howling, and the lunatics inside shrieking, Dr. DaCosta cut down the body, took a large drink of liquor and wrote his resignation.

Next, Dr. DaCosta became assistant physician to the Pennsylvania Hospital for the Insane, then known as Kirkbride's and situated at 44th and Market Streets. Here he came into contact with the great alienist, Dr. Chapin. Dr. Chapin and Dr. DaCosta became inseparable friends, and it is to Dr. Chapin that Dr. DaCosta gives credit for the stimulation of the interest he had in the surgery of the nervous system.

At the termination of his contract with the Pennsylvania Hospital, he became associated with the surgical department of Jefferson under Samuel D. Gross and was appointed a clinical assistant in the Out-Patient Department. At the death of Samuel D. Gross and the entrance of Dr. W. W. Keen to Jefferson as Gross' successor, Dr. DaCosta assumed the position of an office

assistant to Dr. W. W. Keen. His contemporaries were Dr. William J. Taylor and Dr. George Spencer. He opened his first office at 2047 Locust Street in one room on the ground-floor of a house used as a dressmaking establishment. His first patient stole his umbrella and didn't pay him his fee. This office was more or less of a meeting place for Dr. DaCosta and his friends. I well recall many stories in which Dick Parrish, Orville Horwitz and Dr. DaCosta's brother figured prominently as amusing characters of this period. DaCosta, in those days, had very little practice. He spent his time in the hospital and in Dr. Keen's office. His spare time was utilized in editing a dictionary and preparing the first volume of his "Modern Surgery" which was published when DaCosta was 32 years of age. His progress was rapid. At the age of 32 he was a clinical professor of surgery. He had written many articles, had edited a number of books and had written his first volume. At this time, Dr. DaCosta was offered several alluring positions in rival Medical Schools. To hold him at Jefferson Medical College, he was promoted to a full professorship with the consent of Dr. W. W. Keen who was still Professor of Surgery. Dr. DaCosta was then 37 years old. This was in the year of 1900.

At the retirement of the late Dr. W. W. Keen from Jefferson in 1907, and upon the endowment of the Gross Chair by Mrs. Gross, Dr. DaCosta was made the first Gross Professor of Surgery of the Jefferson Medical College—a position which he held until his death. One must not gather from the above that Dr. DaCosta's tenure at Jefferson was one always of unobstructed progress and unalloyed pleasure. He was frank and outspoken in his criticisms. His first and foremost interest was in the students. He was always for the advancement of his Institution. He struck openly and fearlessly at anybody or any condition which interfered with the training of his students whom he loved dearly. This characteristic made him many enemies, but it laid the groundwork for the correction of many of the abuses existing at Jefferson during his time. His renowned speech, "The Professorial Jackpot," delivered before the Alumni Association Banquet, was not merely an oratorical gesture. It had a useful purpose. This diatribe laid bare all of the defects of the Institution and the grabbing qualities of the Professors of that day. They divided the tuition of all the students for personal gain, instead of using it

for the improvement of Jefferson. While this speech made many enemies, it, nevertheless, made one staunch friend, the late Honorable William Potter, then President of the Board of Trustees. This friendship Dr. DaCosta cherished throughout Mr. Potter's life.

During the days of his upward struggle, DaCosta was surgeon to the Eastern Penitentiary, where he met "Split Dunlop," a celebrated bank burglar. Dr. DaCosta published Dunlop's life in the North American in the year 1910. His associations at the Penitentiary threw him in contact with many men whom he afterwards helped both financially and physically. DaCosta was most kindly and sympathetic.

He was very fond of his colored boy, Willie, who had served him for more than twenty years. Willie was brought to the Jefferson Hospital with what is now known as coronary thrombosis. Dr. DaCosta called Dr. Hare and several other members of the staff to see Willie. At four o'clock in the morning, Willie died in Dr. DaCosta's arms. We all begged Dr. DaCosta to let us "post" Willie. This he refused, saying, "I am sure Willie wouldn't like it." And that was all he would say on the subject.

From the outbreak of the World War, Dr. DaCosta served as a Junior Lieutenant. Before the termination of the war he was promoted to the rank of Commander. He served both in America and in France. His trip on the George Washington with Admiral Gleaves was one of his final memories. Admiral Gleaves, that great strategist who brought all of our troops across the Atlantic, was a constant visitor at the DaCosta home during the last illness of Dr. DaCosta. Dr. DaCosta was in pain for a period of ten years.

He had many literary friends whom he loved to meet at the University Club. Among these may be mentioned John Ashurst, Edgar Singer, David Lewis, John F. X. Jones, Dr. McGlinn and Harvey Watts. After leaving the University Club, DaCosta would be a different man. He would then visit the fire house at 21st and Market Streets where he would converse with the lowly with as much pleasure as though he were talking to the intellectual giants of the town.

He loved to go fishing and boating. Some of us recall with pleasure and as memorable days the meetings at Spidel's Hotel in Atlantic City. Here DaCosta acted as a private detective and

wore a badge. The fishing parties usually consisted of Philadelphia and Atlantic City physicians, firemen and local celebrities. Ike Weisenthal, erstwhile chief of the Atlantic City Fire Department, was usually present. In DaCosta's company there never was a dull moment. He was a perfect host. In his final days, he often expressed the wish that he could have one more trip to Atlantic City.

Dr. DaCosta married Mary Roberts Brick, February 26, 1895. It is impossible to speak of Dr. DaCosta's life without mention of his wife's intense devotion to him and to his interests throughout their married life. Mrs. DaCosta thoroughly understood him and made no effort to control him in any way. Her one wish was to see the Doctor pleased and happy. The necessary limitations of time permits the writer of this memoir to refer but briefly to Mrs. DaCosta's care of the doctor during the years of his last illness. It is not known to many that she would sit with him for hours at night, encouraging him in his moments of depression.

With the death of Dr. DaCosta, there passed from Philadelphia's medical and surgical circles the greatest teacher and author that Philadelphia has known in modern times. His ambition to make men stood foremost in his mind. Schwartz, Nassau, Hearn, Owen, Righter, J. F. X. Jones, P. A. McCarthy, Seelaus and the writer are happy to have been numbered among the friends of his later years. To the very last, he anticipated with pleasure our visits and manifested kindly interest in our personal and professional affairs. The end came about 3:00 P.M., May 16, 1933. He died in his library where he spent the final years of his life. He refused to go upstairs because he desired to die among the books that he had loved so well.

MEMOIR OF JOHN SPEESE, M.D.*

By EDWARD B. HODGE, M.D.

Dr. John Speese was born in 1880. He was graduated from the Medical School of the University of Pennsylvania in 1902. From the beginning he turned his attention to surgery. His training was broad and thorough. He gave much time to surgical pathology in his early years besides acquiring extensive clinical experience in several hospitals. Most of his work was done at the Children's and Presbyterian Hospitals; at the time of his death he was President of the Staff of the latter institution. In 1908 he was elected a Fellow of this College; in 1909, a Fellow of the Philadelphia Academy of Surgery, and was its President when he died. During the World War he reached France as a member of the Presbyterian Hospital Unit. Later he saw much service at the front as head of an operating team and, finally, as Chief Surgeon of Mobile Hospital 8. Due to this training and experience, his advance was rapid. He was elected Visiting Surgeon to the Presbyterian Hospital in 1921 and, later, a Fellow of the American Surgical Association. He was also a Fellow of the American College of Surgeons. He combined in high degree the scientific and clinical viewpoints. He was a sound and skilful operator. He contributed many excellent papers to current literature and was the author of several important monographs. He was a faithful member of this College and his whole life and activities redounded to its credit. His untimely death from coronary sclerosis on October 15, 1933, brought sorrow to the Fellows of the College and to his large circle of friends.

* Read January 8, 1934.

THE ANNUAL ADDRESS OF THE PRESIDENT *

By FRANCIS B. PACKARD, M.D.

Since the last Annual Meeting several important changes have been made in the By-Laws of the College of Physicians. The first of these changed the requirements of Fellowship in the College in several important particulars. Instead of the two former classes of Fellows and Associate Fellows it was provided that there should be no further Associate Fellows but instead a class of Honorary Fellows; that all those now holding Associate Fellowships should be automatically designated as Honorary Fellows; and that not only distinguished foreign or American physicians should be eligible for election as Honorary Fellows, but also "persons eminent in science not holding degrees in medicine but who are engaged in the study, research or in teaching of medicine or affiliated or kindred subjects."

The advantage not only to those elected to such Fellowship but also to the College itself is obvious, as the field of the sciences which have a direct influence on medicine, such as biology, chemistry and physics, has become of such vast importance to medicine that a closer affiliation of the profession with workers in these subjects is most desirable.

Another amendment extended the limit of the distance from Philadelphia within which it is necessary for a Fellow to reside from thirty to seventy-five miles, and also did away with the requirement that only residents of the State of Pennsylvania were eligible. This it is hoped will greatly broaden the sphere of usefulness of the College.

On December 1, 1932, our Fellowship consisted of 496 Fellows of whom 42 were Non-Resident Fellows, and 17 Associate Fellows. During the subsequent year we lost by death 9 Fellows, 2 Fellows resigned and 7 forfeited their Fellowships by non-payment of dues.

* Read January 8, 1934.

The total Fellowship of the College on December 1, 1933, was 575, composed as follows:

Active Fellows	519
Non-resident Fellows	40
Honorary Fellows (Foreign)	7
Honorary Fellows (American)	9
	575

À propos of the number of Fellows who have forfeited their Fellowship by non-payment of dues I would call the attention of the College to the fact that in most instances such forfeiture is due to neglect of the delinquent Fellow to make any reply to the follow-up letters which are sent by the Treasurer after the lapse of the usual time allowed for payment. The Council and the Treasurer have tried to ease the situation in every instance in which the Fellow has responded to the Treasurer's communications but in a number of cases the Fellows have not answered the repeated letters which have been sent them.

Another most important amendment to the By-Laws empowered the Council to extend the privileges of the Library and all meetings to the following classes of persons: (1) the holder of a degree from a reputable medical college, who has received such degree too recently to be eligible for Fellowship, or (2) a physician pursuing postgraduate studies in a reputable medical school in Philadelphia, or (3) a physician of the medical corps of the United States Army or Navy or National Public Health Service in Philadelphia or vicinity, or (4) a person who not having received a degree in medicine is actively engaged in the teaching of, or research in, medicine or affiliated or kindred subjects. These privileges are extended free of charge, and terminate automatically when the recipient terminates the status which entitles him or her to them. This liberal action of the College has been much appreciated and is being largely availed of.

The Publication Committee has made a notable change in the publication of the Transactions of the College. Beginning a new series, the Fourth, the Annual Transactions are to be issued each year in two numbers, unbound. Some of the papers read before the College are reproduced in their entirety but many are reprinted only in abstract, with reference to the place of publication elsewhere. This means a very considerable saving to the College.

Meetings. Three stated business meetings and eight stated scientific meetings were held during the past year.

At the January meeting Dr. Hans Zinsser lectured on "Recent Progress in the Investigations of the Rickettsia Group of Diseases" on the James M. Anders Fund.

There were three lectures given on the Mary Scott Newbold Lecture Fund: (1) On March 9 Dr. Burton J. Lee delivered the twenty-ninth Newbold Lecture on "Cancer as a Community Problem." (2) On May 3, Dr. Ronald T. Grant, of London, delivered the thirtieth Newbold Lecture on "Observations on the Prognosis of Valvular Heart Disease," which was supplemented with a second lecture on the same subject on May 5. (3) On October 4, Sir Andrew Macphail, of Montreal, delivered the thirty-first Newbold Lecture, entitled "The Reading of History."

A special meeting of the College was held on November 29, at which Professor Arturo Castiglioni, of Padua, delivered a lecture under the Nathan Lewis Hatfield Prize and Lecture Fund, on "Padua and the Renaissance of Medicine."

The Mütter Lecture was delivered on December 6, by Dr. Arthur B. Duel, of New York, on "The Pathology and Treatment of Facial Paralysis."

The College has received a number of valuable gifts during the year. The late Mrs. Hampton Carson presented a number of letters and photographs. Dr. John A. McKenna, of Lansdowne gave us two pairs of spectacles which had been made by John Dollond the famous London optician sometime between 1730 and 1750, with photographs of portraits of Dollond and John Hunt.

Dr. Benjamin D. Parish presented an interesting letter written by Dr. Samuel D. Gross to his father.

The late Mrs. Joseph Leidy donated a copy of the first edition of Leidy's "Anatomy" bound in human skin, which had been a valued possession of the Author.

The Cadwalader family through Mr. John Cadwalader gave us an invaluable manuscript, the original letter written by Dr. John Mitchell, of Virginia, in 1748, describing the Yellow Fever epidemic of 1741–42 in Virginia, which had been given by Benjamin Franklin to Benjamin Rush and is referred to by the latter in his account of the Yellow Fever of 1793 in Philadelphia.

Dr. Edward B. Krumbhaar presented models of the Piltdown skeletal remains.

An especially notable gift was a beautiful portrait of Dr. Hobart A. Hare, painted by his daughter, Mrs. James P. Hutchinson.

Dr. Alfred Stengel presented a copy of Antonmarchi's great Atlas of Human Anatomy, formerly in the library of the Empress Marie Louise, of France, and bearing her coat of arms on the binding.

Besides these we received many gifts from Fellows and others which are acknowledged in the report of the Library Committee.

The Alvarenga Prize. The prize was awarded to Dr. Harry Shay and Dr. J. Gershon-Cohen for their essay entitled "Experimental Studies in Gastric Physiology in Man."

The Mütter Museum. The active interest of the committee and the zealous labors of the curator, Dr. Harry P. Schenck, have greatly increased the collections in the museum and widened its sphere of usefulness.

The Nurses Directory. It is gratifying to be able to report that in spite of the depression and consequent lack of employment many nurses have continued to pay their annual dues to the Directory and stuck loyally by it. As a result the Directory shows a small balance to its credit. I think it well to remind the College that in the past the Directory for many years contributed annually quite large sums to the support of our Library. In recent years it has suffered severely by competition with the registries for nurses maintained by the various hospitals, and other newly-formed organizations. I would strongly urge the Fellows to avail themselves more often of the facilities it offers, thereby, not only aiding its faithful corps of subscribing nurses but also the College. Most of us have little idea how faithfully and efficiently the Committee labors to maintain the high standard of the nurses on its registry.

Since the semi-annual stated Business Meeting last May the College has lost by death some valued Fellows. The obituary of Dr. J. Chalmers DaCosta has been read by Dr. Shallow and that of Dr. John Speese by Dr. Hodge. The distinguished pathologist, Dr. William T. Councilman, who was elected an Associate Fellow on February 5, 1908, died on October 4, 1932.

Dr. William E. Edwards, who was elected a Fellow of the College on February 2, 1887, died at El Cajon, California, on November 15, 1933. Dr. Edwards won distinction as a pediatri-

cian. At the time of his death he had retired from practice for many years.

Library and Hall. Miss Mary F. Zelner, after nearly a quarter of a century of faithful and efficient service, has resigned the position of Clerk of the College and Hall Superintendent which she has been recently filling. The latter position has been combined once more with that of Librarian and from January the first, both positions will be filled by Mr. Walton B. McDaniel, who was appointed Librarian last July and has since been performing his duties with efficiency and tact. Miss Helen Farrell, who has been assisting Miss Zelner for some time and is familiar with the work of the office, has been appointed Clerk of the College and as such will assist the Secretary and Treasurer in the work of the office.

As there is so much other business to transact this evening I shall not make any statement as regards the Library nor the finances of the College because they are amply dealt with in the reports of the two Committees having charge of their affairs.

As this is the last occasion on which I have the honor to preside as your President I can not refrain from an expression of my gratitude for the loyal support I have received from the Fellows of the College during what has unfortunately been a very troublous time in the administration of the affairs of the Library and Hall. This condition was the result of a number of factors which it is unnecessary to enumerate. I hope that at length our situation has been straightened out and that the tranquility of our Hall will be no more disturbed by such undignified domestic broils and internal dissensions.

ANNUAL REPORT OF THE LIBRARY COMMITTEE FOR 1933

Mr. President: In accordance with the ordinances and By-Laws of the College, I herewith submit the following report of the Library Committee for the year 1933:

Inventory

(Based upon statistics in the 1932 Annual Report)

An account of stock has been taken and any displacements found arranged in their proper order.

		1933	1932
Total number of volumes in the Library		173,021	169,045
Bound volumes, including 488 manuscripts	140,542		
Unbound Reports and Transactions	25,040		
Unbound Periodical "Reserves"	4,467		
Unbound volumes more or less incomplete	2,972		
	173,021		
Other unbound material		238,587	230,266
Pamphlets (less than 100 pages)	211,793		
Theses and Dissertations	26,794		
	238,587		
Duplicates		9,737	9,240
Portraits		27,206	23,941
Total of all items in the Library		448,551	432,492

Distribution of this Material

(~~Excluding the duplicates and portraits~~)

	Bound	Unbound (Excluding Reports and Transactions)	Total
General Library	136,350	245,607	381,957
On permanent deposit:			
Gross Library	3,782	4	3,786
Library of the Obstetrical Society of Philadelphia	217	0	217
Mütter Museum *	193	0	193

* The books of the Mütter Museum are not permitted to be removed from the College building.

Current Periodicals

We have listed November 1, 1933, 1391 current periodical publications, including Transactions and Reports:

	By purchase	Exchange or Gratis	Total
1. American	142	402	544
2. Belgian	6	10	16
3. British	80	22	102
4. Canadian	4	5	9
5. Chinese	2	2	4
6. Cuban	—	6	6
7. Danish	7	1	8
8. Dutch	4	2	6
9. Finnish	2	5	7
10. French	130	27	157
11. German	231	15	246
12. Greek	—	3	3
13. Indian	2	6	8
14. Italian	76	26	102
15. Japanese	5	19	24
16. Mexican	—	11	11
17. Polish	—	7	7
18. Russian	2	5	7
19. South American	5	59	64
20. Spanish	7	12	19
21. Swedish	5	6	11
22. Swiss	3	1	4
23. Miscellaneous, (Algerian, Czechoslovakian, Egyptian, Roumanian, etc.)	6	20	26
	719	672	1391

This total of 1391 includes 13 new titles added during the year; 1 by purchase, 12 in exchange or gratis. It does not include 84 titles of periodicals of which we have two or more numbers, but of which no 1933 issues have as yet been received.

During the year there were received from all sources 3444 volumes (including 420 unbound Reports and 632 duplicates); 5283 pamphlets; 7866 numbers of various periodicals.

Accessions

Unbound material and duplicates are not accessioned. By purchase, 1353 volumes; by gift, 677; by exchange, 330; totalling 2392 volumes.

Donations. The individual donors for the past year, ending November 1, 1933, number 416. The following list records donors of twenty or more volumes: Mrs. A. P. C. Ashhurst, Dr. D. T. Cooke, Dr. J. M. Deaver, Mrs. F. X. Dercum, Dr. R. P. Elmer,

Mrs. R. S. Hooker, Mrs. A. S. Kite, Dr. E. B. Krumbhaar, Dr. E. B. Meigs, Presbyterian Hospital, Mrs. B. A. Randall, Dr. J. E. Talley, Dr. T. S. Westcott.

Various publishing houses have presented volumes as follows: P. Blakiston's Son & Co., 10; F. A. Davis Co., 8; Paul B. Hoeber, Inc., 1; Lea and Febiger, 10; J. B. Lippincott Co., 20; C. V. Mosby Co., 2; Sanitary Publishing Co., 1; W. B. Saunders Co., 44; Wellcome Foundation, Ltd., 1; Williams and Wilkins Co., 1.

The Library is indebted for large gifts of pamphlets and unbound periodicals to the following donors: Dr. H. B. Allyn, Mrs. A. P. C. Ashhurst, Biological Abstracts, P. Blakiston's Son & Co., Dr. B. Chance, Columbia University, Mrs. F. X. Dercum, Dr. W. A. N. Dorland, Dr. G. M. Dorrance, In Exchange (Medical Library Assoc.), Dr. S. M. Hamill, Dr. A. Hand, Paul B. Hoeber, Inc., Johns Hopkins Hospital (Dept. of Medicine), Miss Florence Keen, Dr. E. B. Krumbhaar, Mrs. J. Leidy, 2nd., J. B. Lippincott Company, Dr. G. M. Marshall, Dr. D. J. McCarthy, Dr. E. J. Morris, Philadelphia Academy of Surgery, Philadelphia Pathological Society, Presbyterian Hospital, Dr. D. Riesman, W. B. Saunders Co., Dr. G. E. de Schweinitz, Dr. J. D. Seiberling, Dr. J. E. Talley, U. S. Department of Commerce, U. S. Department of Interior, U. S. Public Health Service, University of Pennsylvania, Dr. J. Walsh, Dr. M. P. Warmuth, Dr. T. S. Westcott, Western Reserve University (Institute of Pathology), Dr. J. C. Wilson, Dr. W. Zentmayer.

Fifteen volumes were presented by the following authors or editors: Drs. J. T. Appleton, J. A. Berry, H. W. Cattell, B. Chance, M. Corti, P. M. Dawson, A. M. Garcia, H. Goodman, C. F. Krafft, E. B. Krumbhaar, F. H. Krusen, E. Libman, N. Perry, E. A. Wasson, Miss C. B. Soule.

Fourteen volumes were sent by the publishers at the request of the following authors or editors: Drs. W. H. F. Addison, F. H. Adler, W. S. Bainbridge, W. B. Cadwalader, G. M. Dorrance, B. Goldberg, L. Goldstein, L. C. Harper, M. G. MacNevin, M. K. Meyers, G. Lusk, I. S. Ravdin, G. Wagoner, J. Walsh.

Summary of Expenditures from the Funds

(The list of expenditures represents sums paid for current periodicals as well as for bound volumes.)

Endowed Library Funds	Volumes Purchased	Cost
Henrietta Rush Fales Baker Fund	33	$ 477.96
Luther S. Bent Fund	10	116.65
William T. Carter Fund	6	69.38
Gerardus Clarkson Fund	5	159.87
Francis X. Dercum Fund	40	98.30
Louis A. Duhring Fund	11	182.33
Augustus A. Eshner Fund	25	577.14
Friends of the Library	8	15.00
John D. Griscom Fund	49	579.60
Richard H. Harte Fund	36	470.46
Charles T. Hunter Fund	2	24.77
William F. Jenks Fund	54	503.46
Oliver A. Judson Fund	14	63.18
William V. and John M. Keating Fund	8	25.81
William W. Keen Fund	38	375.50
Henry Leffmann Trust	0	356.41
Library Endowment Fund	147	673.97
Horace Magee Memorial Fund	123	438.62
J. Ewing Mears Fund	31	350.33
Charles K. Mills Fund	1	18.53
Weir Mitchell Fund	51	116.21
E. E. Montgomery Fund	17	172.75
John H. Musser Fund	6	16.32
Elizabeth K. Newcomet Fund	16	114.88
William F. Norris Fund	9	398.61
Charles A. Oliver Fund	8	49.37
Philadelphia Medical Society Fund	9	70.94
Lewis Rodman Fund	43	484.74
Douglas Stockton Warren Fund	27	241.05
John F. Weightman Fund	7	95.14
J. William White Fund	23	417.22
Casper Wistar Fund	27	347.66
George B. Wood Fund	1	8.58
S. Lewis Ziegler Fund	16	472.90
	911	$3,039.90
From the General Account	379	$ 327.33
From Special accounts:		
Fund for rare and valuable books	45	639.77
Fund for completing files of journals	11	57.50
Petty Cash Account	2	4.18
Photostat Fund	5	147.40
	63	$ 848.85
Total volumes purchased	1353	$4,216.08

(In 1932, 1517 volumes were purchased, in 1931, 1890 volumes).

Readers' Use of the Library

The Library has been kept open two evenings each week and on the five minor legal holidays, as has been customary. It was

decided that beginning October 2, 1933, the Library should be kept open on Mondays, Tuesdays, Thursdays and Saturdays until 6 P.M.; and on Wednesdays and Fridays until 10:30 P.M.: this to be in force for six months, in order to determine whether the extra hours might be justified.

* *Number of readers:*

	Visitors	Fellows	Total
Day	7,238	1,316	8,554
Evenings (74)	1,459	168	1,627
Legal Holidays (5)	200	28	228
	8,897	1,512	10,409

Circulation of books:

Number of volumes taken out	5,189
Number of volumes consulted in the Library	47,130

The number of books "consulted in the Library" includes only those supplied on demand. Readers have access to the bound volumes of periodicals and works of reference kept on the shelves in the Reading Room, and the Fellows of the College have access to the Book Stacks. There are, therefore, many volumes consulted of which no accurate record can be kept.

Use of Study Rooms:

Average number of rooms in use throughout the year, 2.

Number of volumes used in these rooms during the year, 1285.

Exchanges

We have distributed books and journals on exchange account to 28 institutions and have received three similar distributions.

3903 Theses and Dissertations have been received from the following European Schools of Medicine with which we exchange publications at the present time: Universities of Amsterdam, Basel, Berlin, Bonn, Breslau, Erlangen, Giessen, Göttingen, Heidelberg, Kiel, Königsberg, Lausanne, Leiden, Leipzig, Liège, Marburg, Paris, Rostock, Würzburg.

Work of the Cataloguers

Number of works classified, shelf-listed, and for which cards were filed	1,368
Cards typewritten, examined, and filed	6,923
Library of Congress and other cards altered and filed	10,070
Pamphlets and reprints subject-headed and arranged alphabetically by subject, and by author under the subject	285

* These figures, and all the figures in this report, have been calculated as accurately as the unsettled conditions of the Library, due to changing personnel, during the past year allowed.

Incunabula and Other Books of Interest Added to the Library During the Year

Incunabula

(Total number of incunabula at this date, 408, of which 302 have been photostated.)

Albertus Magnus. Compendium theologicae veritatis. . . . Venetiis, Christophorus Arnoldus, 1476. Illuminated initials. Manuscript notes. [Hain No. 439. Gesamtkatalog No. 604.]

Fund for Rare Books.

This is the 21st incunable of Albertus Magnus to be acquired by the Library, the first having come into our hands in 1884.

Andreae, Johannes. [Tractatus super arboribus consanguinitatis. . . .] Norimbergae, Fridericus Creussner, 1477. Rubricated. [Hain No. 1030. Gesamtkatalog No. 1688.]

Fund for Rare Books.

The present copy, our first of this work and author, was formerly owned by the University Library at Breslau.

Other Books

Alexius Pedemontanus. De secretis libri. . . . Io. Iacobo weckero interprete. Basileae, Ap. Petrum Pernam, 1560.

John D. Griscom Fund.

The Library has editions of this once remarkably popular work in Latin, French and English, but none, unfortunately, in the original Italian, or in German.

Allwoerden, Henricus Ab. Historia Michaelis Serveti. Helmstadii, stanno. Bucholtziano, [1728]. *John D. Griscom Fund.*

Angelucci, Theodoro. De natura et curatione malignae febris libri IIII. . . . Venetiis, Ap. Robertum Meiettum, 1593.

Friends of the Library Fund.

Angelucci's other medical work, *Ars medica ex Hippocratis et Galeni thesauris potissimum deprompta,* Venice, 1588 and 1593, is not listed in our catalogue.

Antommarchi, F. Planches anatomiques du corps humain exécutées d'après les dimensions naturelles, accompagnées d'un texte explicatif. Publiées par le Comte de Lasteyrie. 2 vols. Paris, 1826. *Presented by Alfred Stengel, M.D.*

These books derive special interest, apart from their superb life-sized plates, from the fact that they are dedicated to Napoleon by their author, his friend and physician at St. Helena; and from the additional fact that they belonged to the library of the Empress Marie Louise, whose monogram they bear.

Aretinus, Leonardus. Isagoge in philosophia[m] moralem Leonardi Aretini ad Galeotu[m] eruta ex Aristotelis . . . dialogo ad Eudemium amicum suum. Viennae, per Hieronymum Victorem, 1515. *Fund for Rare Books.*

Arma, Joannes Franciscus. De vesicae et renum affectus dignotione et medicatione liber. Bugellae, 1550.
John D. Griscom Fund.

This curious and rare treatise is couched in dialogue form, the interlocutors being Aeger and Arma: the allusions and references are as often literary as medical. The author was a court physician and is credited with nine medical works of which the Library possesses only this one.

Bairo, Pietro. De medendis humani corporis malis enchiridion. . . . Basileae, ap. Petrum Pernam, 1561. Bound with Alexius Pedemontanus, listed above. *John D. Griscom Fund.*

A *vade mecum* by another 16th cent. physician much sought out by princes. The prescriptions are altogether princely in extent and variety.

de Bienville, J. D. T. La ninphomania, o sia il furore uterino . . . traduzione dal Francese. Venezia, Nella Stamperia Graziosi a S. Appollinare, 1792. *Fund for Rare Books.*

Of this little-recorded work the Library has editions in Italian, English, and French (four of the latter, including the original).

Brugis, Thomas. The marrow of physicke. . . . London, T. H. and M. H., 1648. *Presented by Charles W. Burr, M.D.*

A charming example of 17th century book-printing, and a welcome supplement on our shelves to the author's once popular *Vade Mecum.*

Corti, Matteo. In Mundini anatomen explicatio. Papiae, Moschenus et Niger, 1550. *John D. Griscom Fund.*

Corti's text of Mondino, preceding the Commentary, is generally considered one of the best.

Donatus, Marcellus. [De medica historia mirabili lib. sex. Liber Septimus a Gregorio Horstio.] Francforti, typ. Hier. Polichii, 1664. *John D. Griscom Fund.*

Horst's complementary book brings the account of medical miracles to his own day. Four copper-plate illustrations include one of a Caesarean section, the foetus having been dead twelve years!

Fantoni, Joh. Baptista. Observationes anatomico-medicae. Hâc tertiâ editione recensuit, notis, et observationibus illustravit, et auxit Joannes Fantonus fil. . . . Accedunt . . . D. Lancisii Dissertationes II: . . . De Physiognomiâ; . . . De sede Cogitantis animae. Venetiis, Poleti, 1713.

Fund for Rare Books.

This edition contains the full 37 observations, as contrasted with the earlier editions' 31.

Fernellius Ambianus, Joannes. Opera medicinalia. Venetiis, ap. Rutilium borgominerium, 1564. *Fund for Rare Books.*

We now have five early editions of the *Opera*, including the Paris original of 1554, and that of Paris, 1567, considered one of the finest.

Filadelfo pellegrino incognito. L'arca medica. Roma, Antonio de Rossi, 1708. *Friends of the Library Fund.*

An almost unrecorded little book of "remedies" and "preservations," accompanied by a *Calendario astronomico perpetuo.* The pseudonymous author warns us that it is written for the poor, the simple, and the unlearned; and it carries the *imprimatur* of the church.

Galen, Claudius. De temperamentis libri III; de inaequali intemperie liber I. Thoma Linacro Anglo interprete. Cum isagoge, . . . et scholiis marginalibus . . . per Iacobum Sylvium. Parisiis, Wechelus, 1537. *Fund for Rare Books.*

One hundred and eight separate medical works of Galen have been recorded. The Library's collection of the early *Opera Omnia* of Galen numbers eleven; we have, furthermore, 97 early editions comprising one or more of the titles. The present acquisitions are indicative of our purpose eventually to have accessible here as many as possible of the titles singly or in small collections.

Galen, Claudius. Introductio in pulsus ad teuthram, Martino Gregorio interprete. Eiusdem de pulsuum usu, Thoma Linacro interprete. Parisiis, Wechelus, 1537.

Fund for Rare Books.

Gal[en], Cl[audius]. Libellus, cui titulum fecit, quos, quibus, et quando purgare oporteat; a Sebastiano Coquillato Scipione in linguam Latinam conversus, eiusdemq[ue] commentariis illustratus. . . . Lugd., ap. Gulielmum Rovillium, 1557.

John D. Griscom Fund.

Highmore, Nathaniel. Corporis humani disquisitio anatomica in qua sanguinis circulationem . . . Sequtus est. Hagae-Comitis, ex officina Samuelis Broun, 1651.

Fund for Rare Books.

This is the original edition of the notable work which discovered for us the antrum of Highmore.

Hippocrates. Hippocratis Coi opera quae extant graece et latine . . . , restituta . . . digesta . . . illustrata a Hieron. Mercuriali. Venetiis, Junta, 1588. *Fund for Rare Books.*

Mercurialis' esteemed edition published by the Junta press; it contains the Onomasticon of Erotian and the Glossary of Herodotus.

Hooke, Robert. Microscopic observations; or Dr. Hooke's wonderful discoveries by the microscope, illustrated by thirty-three copper plates, curiously engraved. London, Wilkinson, 1780. *Fund for Rare Books.*

An interesting abridgement of the famous *Micrographia.*

Lancisi, Giovanni Maria. Opera varia. Venetiis, Pecor, 1739.

Fund for Rare Books.

The first fully representative edition of the great epidemiologist, published 19 years after his death.

Manuel II, King of Portugal. Early Portuguese books 1489–1600 in the Library of His Majesty, King of Portugal. London, Maggs, 1932. v. 2. *Fund for Rare Books.*

Matthiolo, Pietro Andrea. Commentarii secundo aucti, in libros sex Pedacii Dioscoridis. Adjectis quamplurimis plantarum, et animalium imaginibus, quae in priore editione non habentur. Venetiis, Valgrisius, 1558. *Fund for Rare Books.*

This edition is the third of Mattioli's commentary to be acquired by the Library.

Mercurialis, Hieronymus. De venenis et morbis venenosis tractatus locupletissimi . . . excepti, atque . . . digesti: opera Alberti Scheligii Ubarschaviensis. Venetiis, ap. Paulum Meietum Bibliopolam Patavinum, 1588. *Fund for Rare Books.*

The first copy of this particular work, one of those unfortunately not published by Mercurialis himself, to be acquired by the Library.

Montanus, Ioannes Baptista. In primam fen libri primi canonis Avicennae explanatio, a Valentino Lublino Polono collecta. Venetiis, ap. Baltassarem Constantinum, 1554.

John D. Griscom Fund.

Petrus de Abano. Expositio . . . in librum problematum Aristotelis. Alexandri Aphrodisei problemata per Georgium Vallam Placentinum in Latinum translata. Plutarchi Cheronei . . . problemata eminentissima. Venetiis, Bonetus Locatellus, 1501.

Fund for Rare Books.

An interesting collection: individually, the Abano *Expositio* and the Valla translation of Alexander are represented in our incunabula.

Pistorius, Joh. Consilium antipodagricum, sive dissertatiuncula brevis de arthritide morbo . . . das ist: Kurzer und grundlicher Bericht von der . . . Krankheit der Gliedersucht, Zipperlein oder Podagra. Halberstadt, Praetor, 1659.

Fund for Rare Books.

German text, with marginal analyses in Latin.

Regimen sanitatis Salernitanum. Conservandae sanitatis praecepta saluberrima, . . . rhythmis Germanicis illustrata. Cum . . . Arnoldi Villanovani . . . exegisi; per Ioannem Curionem. Francoforti, ap. haer. Chr. Egenolphi, 1559.

John D. Griscom Fund.

The Library now contains 61 of the 240 recorded editions of the Regimen; 9 have a text in French, 8 in English, 6 in German, 1 in Italian, the others in Latin only. It is our hope eventually to complete the collection.

Regimen sanitatis Salernitanum. Regimen sanitatis . . . nunc Germanicis rythmis illustratum [per Ioannem Busmannum] Vitebergae, ap. Georgium Rhau, 1546. *In Exchange.*

Rondeletius, Gulielmus. Opera omnia medica, . . . studio et opera J. Croqueri . . . repurgata et . . . restituta. Editio postrema, aliquot opusculis huius Authoris nondum antehac editis aucta. Genevae, Chouet, 1620. *Fund for Rare Books.*

The first "complete" edition of the famous 16th century physician and naturalist to be acquired by the Library.

Ryder, Hugh. New practice of surgery: being a methodical account of divers eminent observations, cases and cures, very necessary and useful for surgeons, in the military and naval service. 2 ed. London, Taylor, 1693.

From the Library of the late Dr. Robert H. Alison,

Presented by Joseph Holland Cloud, M.D.

The author of this little book is not listed in the Surgeon-General's Catalogue, nor in the major pertinent books of reference. The *Bibliotheca Chirurgica* (Vigiliis) gives the date, of its first edition presumably, as 1689, though the censor's *imprimatur* in the book itself is dated March 14, 1688.

The book-seller, in a somewhat belligerently defensive note to the reader, informs us that the author was "for many years an Hospital-Surgeon in our Sea-Fights, where he was employed in the Navy-hospitals, having under his care six, seven or eight hundred wounded men at a time. . . ." A testimonial letter from the redoubtable Gideon Harvey, after expressing the opinion that the observations are "very ingenious, elaborate, and worthy of remark," concludes with the slightly ambiguous compliment that "by the Contents of this Treatise, it appears that the Practice of Surgery in England is parallel to that of France, Italy, or other nations." The author was evidently a strict empiricist, since the name of any other medical writer is not easily discoverable in his book.

Ryff, Walter Hermann. Die gross Chirurgei oder volkommene Wundtartzenei. Chirurgischen Handtwirckung eigentlicher Bericht, und Inhalt alles so der Wundartznei angehörig . . . (engraved and colored title page). Franckfurt am Meyn, Egenolph, 1545. *John D. Griscom Fund.*

The original edition of this work by the industrious, and none too scrupulous, 16th century compiler and polygraph.

Servetus, Villanovanus, Michael. In Leonardum Fuchsium apologia. [Lyons, Gilles Huguetan], 1536. Facsimile reprint. Oxford Univ. Press, 1909. *Friends of the Library Fund.*

Seutter, Mang. Ein vast Schönes und Nutzliches Buech von der Rossartzney. . . . Augspurg, Manger, 1588. [Engraved titlepage.] *Fund for Rare Books.*

van Swieten, Gerard. Commentaria in Hermanni Boerhaave aphorismos de cognoscendis et curandis morbis. Vol. 1, 4th ed. Lugd. Batav., Verbeek, 1766.

Presented by Francis R. Packard, M.D.

The Library's holdings in this monumental work include the original edition published at Leyden, 1742–72, with the Index of 1776, and contemporary editions in French and English.

Sydenham, Thomas. Entire works of Thomas Sydenham, newly made English from the originals; . . . To which are added, explanatory and practical notes, from the best medical writers; with others by the translators; . . . 4th ed., with all the notes inserted in their proper places. By John Swan. London, Cave, 1763. *Presented by James Hendrie Lloyd, M.D.*

Tagaultius, Joannes. Institutione di ciru[r]gia distinta in libri cinque. . . . Aggiuntovi il sesto libro della materia di Ciru[r]gia, di Giacomo Hollerio. Venetia, Cornetti, 1585.

Fund for Rare Books.

Victorius Faventinus [de Victoriis], Leonellus. Practica medicinalis, cum scholiis Ioannis Kufneri. De aegritudinibus infantium, eodem authore, Tractatus. Item, Appendix ad eundem per Georgium Kufnerum iuniorem. Ludg., Frellonius, 1561.

Petty Cash Account.

A medical writer of the Arabian school, notable chiefly for this early treatise on pediatrics, which is now accessible for the first time in this Library, although we have other editions of the *Practica.*

Wickner, Conradt. Das man sich vor dem zukuenfftigen sterben oder Pestilentz nicht entsetzen soll. Nuernberg, Peypus, 1530.

John D. Griscom Fund.

This is an early, and rare, theological exhortation to the people not to be afraid of the Plague.

Manuscripts

Ashhurst, J. Bibliotheca medica. Philadelphia, 1866.

Presented by Mrs. A. P. C. Ashhurst.

The "grand total" of books, as counted by Dr. A. P. C. Ashhurst in 1893, was 9630. The Catalogue was begun in 1866 and the bastard "title-page" bears the sagacious words of an unknown writer *de re medica:* Qui non legit, stultus; qui legit tantum, imperitus.

Ashhurst, J. Class book, session 1890–91. [University of Pennsylvania, Department of Medicine.]

Presented by Mrs. A. P. C. Ashhurst.

The list of students, recorded largely, as is the following ms., in Dr. Ashhurst's hand, numbered 168, of whom 129 passed, 17 failed, 21 withdrew, and 1 died.

Ashhurst, J. Examination averages 3d year, and Graduating Class, 1894–95. [University of Pennsylvania, Department of Medicine.] *Presented by Mrs. A. P. C. Ashhurst.*

Chance, B. John Cooke Hirst, M.D. [Typewritten.]

Presented by the Author.

This biographical sketch was originally prepared for a meeting of the College in 1925 after Dr. Hirst's death, but was never actually delivered. It was rewritten by the author and through his courtesy has been deposited in the Library, since it is the only extended biographical notice of its subject.

Falconar, Magnus. Lectures on anatomy, physiology and surgery.

Fund for Rare Books.

The preface to the published (London, 1777) *Synopsis of a course of lectures on Anatomy and Surgery,* by Magnus Falconar, Surgeon and Pro-

fessor of Anatomy, indicates that his students were presented, or purchased, an interleaved manuscript synopsis of the lectures. This is evidently one of the class copies belonging to a not too earnest student, since the interleaves are rarely defiled. Falconar contributed the third part to his master's and colleague's, William Hewson's, *Experimental inquiries* (London, 1777).

Hodge, H. L. Catalogue of medical library. Philadelphia, circ. 1870. *In Exchange.*

The catalogue, apparently not in the owner's hand, lists 1118 books, a large number of pamphlets, and the author's collection of anatomical and obstetrical plates.

Hodge, H. L. Manuscript book of prescriptions. Philadelphia, 1818. *Presented by Edward B. Hodge, M.D.*

This little ms. note-book, in its original leather case, begins with the year 1818, the year in which Hodge won his doctoral bonnet, and closes with the year 1831, in the early period of his development of the lever pessary.

Keen, W. W. Outline for a book on Artistic Anatomy. *Presented by W. W. Keen, M.D.*

A projected book which unfortunately never materialized. It is carried, in the author's hand, as far as chapter 4, *The head.* The preceding chapters contain general remarks on the bones and joints (chapters 1 and 2). Chapter 3 deals with the spine. The title was to be *Artistic Anatomy* "or better," *Anatomy for Artists.*

King, E. S. J. The nature of the stroma of the ovary. [Essay for the Alvarenga Prize, 1931.] *Presented by the Alvarenga Prize Committee.*

The author of this prize-winning essay is a Fellow of the Royal College of Surgeons and resides at Melbourne, Australia.

Laennec, R. T. H. Cours de médecine. Première année. Early 19th Century. *John D. Griscom Fund.*

A highly interesting manuscript in an exceedingly fine, but legible hand, presumably a student's. The headings are in a more professional hand and it is probable that this is a class book somewhat similar to the Falconar. As an intimate source of information about Laennec's professional teachings it is unique.

Lusk, W. T. Diagnosis and treatment of extra-uterine pregnancy. [Typewritten.] *In Exchange.*

This is an essay of 170 pages written apparently in the latter part of the year 1888 or the early part of 1889 and bearing at its head the motto: "The resources of surgery are rarely successful when practised on the dying." Some of its material seems to have been incorporated in a paper of the same title read by Lusk before the New York Obstetrical Society, November 3d, 1891, and in the editions of the author's famous *Science and art of midwifery,* subsequent to 1889.

Muenz, I. Jewish physicians of the middle ages; a contribution to the cultural history of the middle ages. Personal translation of Samuel X. Radbill, M.D. Philadelphia, 1933. [Typewritten.] *Presented by Samuel X. Radbill, M.D.*,

This is a translation made by Dr. Radbill for his own use of the German original (published in 1922) which is also available in the Library. Dr. Muenz's work is perhaps the most comprehensive survey of its field, and the Library considers itself well favored by the gracious gift of this able translation at the hands of a Philadelphia physician.

Stillé, A. Theory and practice of medicine.
Presented by William Pepper, M.D., and E. B. Krumbhaar, M.D.

This is evidently a class syllabus in multigraph of Professor Stillé's lectures at the University, annotated here and there in a student's hand. There are two volumes (in single binding), each with an index.

Stokes, J. H. The fundamentals of everyday dermatology. 1931. [Multigraphed.] *Presented by the Author.*

Dr. Stokes' well-known work, at present available only in this form, has been revised by the author biennially for the last ten years.

Tyson, J. Lectures on pathology; with Lectures on surgery by D. H. Agnew.
Presented by William Pepper, M.D., and E. B. Krumbhaar, M.D.

Similar to the Lectures of Professor Stillé above. These, however, are studiously annotated; under the section head *Lipoma,* there is the reminder: "Look out for a lipoma for Professor Tyson at the end of session."

Miscellaneous

Binding: 858 volumes have been bound.

Photostat: 326 prints have been furnished to Fellows; 169 prints to other than Fellows; 2899 prints to the Library. The latter include 3 volumes of incunabula (bringing the total of photostated incunabula to 302), portraits, copies of rare books on loan, etc.

Sale of Duplicates: amounted to $111.75.

Fines: amounted to $39.40.

294 copies of the Transactions were sent as gifts or in exchange for 236 publications of other organizations. In response to requests sent out since June 1st we have received agreements from 35 publishers or editors to send their periodical publications for which we have hitherto subscribed, either as a gift or in exchange for the Transactions of the College during the coming year.

Exhibits: During the year the Library held Exhibits in Commemoration of: the 75th Anniversary of the Pathological Society; the Bi-centenary of the Blockley Almshouse; the 100th Anniversary of the first Publication of Beaumont's "Experiments and Observations"; the 300th Anniversary of the Birth of Bernardo Ramazzini. Other Exhibits were held on: Physical Diagnosis; Poliomyelitis; Maternal Mortality; Medical Economics. These exhibits aroused much interest and attracted many visitors to the Library.

Volunteer work: Miss Julia Whittmore has given her time generously to several Library projects, particularly to the arrangement of the portrait catalogue.

A complete list of all the Funds and the expenditures for the year is given in another part of this report. All additional expenses, salaries, binding, etc., have to be governed according to the funds appropriated by the College to the Library Committee annually.

Dr. W. B. McDaniel, 2d, was appointed Librarian on June 1st, 1933.

E. B. Krumbhaar, M.D.,
Chairman.

RECENT ADVANCES IN THE STUDY OF TYPHUS FEVER *

By HANS ZINSSER, M.D.

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Typhus fever has never been, in the United States, the calamitous epidemic disease which, for centuries, it has been in Europe. Nevertheless, it has occurred in epidemic form at various times during the nineteenth century in the larger cities of the east coast—Boston, New York, Philadelphia and New Orleans. The Philadelphia outbreak of 1836 was the subject of the now classical report of Gerhard. There were further small epidemics in Philadelphia in 1881 and in New York in 1891 and 1892. In all of these American outbreaks the disease started among and was usually limited to the quarters occupied by recently arrived immigrants, and was probably an importation of the European variety. The same is true, we believe, of the cases described by Brill in New York (1896 to 1909), which were clinically recognized as typhus by Friedman and experimentally studied by Anderson and Goldberger. While there are still differences of opinion on the questions of the European or American origin of Brill's disease, available evidence inclines us to believe that these cases were of imported, European origin and not examples of the endemic disease observed by Maxcy and identical with Mexican typhus. This question cannot be settled conclusively until animal passages of the infectious agents from cases originating in New York can be studied in the light of our present information.

There is considerable evidence to show that typhus existed in Mexico before the conquest. The historical studies of Nicolas Leon and of Torres suggest that the disease was known among the Aztecs, was responsible for the fall of the kingdom of Tollan in 1116 and may have been the cause of an earlier migration of the Indian populations toward Mexico City. Mooser, who has studied the Spanish documents with some care, expresses himself as favoring the belief that both in the pre-Columbian days and during the

* Read January 4, 1933.

Spanish era, typhus fever was present in Mexico in epidemic form. There was in Mexico, for a time, a school of clinicians—of whom Torres was the leader—who believed that clinical differences existed between European typhus and Mexican tabardillo. These differentiations, however, being based on clinical observation alone, lacked conclusiveness. The fundamental studies of tabardillo by Ricketts and Wilder and by Anderson and Goldberger revealed so much similarity between the virus of this disease and of that of European typhus that it was, until quite lately, assumed that the two are identical. Indeed, there was no experimental reason for any other point of view until M. H. Neill [1] of the U. S. Public Health service in 1917 described, in guinea pigs inoculated intraperitoneally with blood of typhus patients from El Paso and Laredo, the scrotal swelling and the inflammations of the tunica vaginalis which we now recognize as characteristics of the American variety of the virus. Considering Neill's accurate description, it is singular that these lesions escaped the attention of subsequent investigators until Mooser began his studies. Mooser's [2] paper of 1928 constitutes the first precise recognition of a distinct variety of American or New World typhus. The criteria of differentiation established by him at this time are based entirely on the reactions observed in guinea pigs intraperitoneally inoculated with the virus. Although the two diseases, European and American, are clinically indistinguishable in man, and although a close relationship is apparent from cross-immunity observed in animal experiments, there are differences between them in the guinea pig disease which stamp them as recognizable variants of the originally identical virus stock. The opportunities this offers for the study of the evolution of disease were discussed by us before the Association of American Physicians last spring. The existing differences described by Mooser were, roughly, the following: The Mexican virus produces in intraperitoneally inoculated guinea pigs, with considerable regularity, the scrotal swelling described by Neill. It gives rise at the same time to a temperature reaction which comes four days earlier and ends sooner than does that induced by the European variety. The brain lesions which are pathognomonic of European and African guinea pig typhus, if the brains are examined between the twelfth and the fifteenth days, are less numerous and regular in animals inoculated with the Mexican virus, possibly because the early evolu-

tion of the tunica inflammation may partially immunize the animals before the brain lesions have a chance to develop. In rats, the Mexican Rickettsia produce a disease which is apparently more severe than that resulting in these animals from inoculation with the European virus, possibly, as we shall see, because of an adaptation due to habitual passage of the Mexican virus through these animals in the cycle of transmission.

The most important differential characteristic is the tunica lesion. That this is not due to intercurrent contaminating organisms pre-existent in the experimental animals or picked up in manipulation seems clear from the many observations which we will submit presently. But even from the beginning, the mere fact that Neill observed it twice and Mooser at least ten times in first inoculation generations from typhus blood, and that others have had similar results since then constitutes strong circumstantial evidence against experimental contamination.

In studying the histology of the scrotal swelling, Mooser (1928) observed within the cytoplasm of some of the cells lining the tunica vaginalis small Giemsa-staining rods which closely resembled the Rickettsia provaceki of infected European lice and which could not be cultivated. He suggested that these organisms were Rickettsia and represented the etiological agents of Mexican typhus.

We were at this time engaged with Batchelder [3] in a comparative study of the European and Mexican varieties of the virus in guinea pigs, and were able promptly to confirm all of Mooser's statements. The studies then started have been continued by us, at first with Batchelder, then and now with our present associate, Dr. M. R. Castaneda, at the Harvard University Medical School, and for some of our epidemiological studies in collaboration with Mooser in Mexico City. In this, as well as in the present practical investigation of our immunological work, we have had the generous assistance of the Mexican Government; and the observations being made in Mexico by Dr. Varela, Dr. Casco and others are contributing information which we would be unable to obtain in a country where the disease is as rare as it is in the northern United States.

In our preliminary work with Batchelder, beside confirming Mooser's findings, we had managed to get the Mooser Rickettsia to multiply in tissue cultures and had reproduced the disease

with ten-day-old cultures; we had shown that the virus was not filterable and that the tunica material, in which the Rickettsiae were plentiful, was about a thousand times more virulent than was the blood of the same animal; this had also been observed by Mooser. We had observed series of inoculations in which the scrotal swelling disappeared for several generations, to reappear in subsequent passages. We had studied the protective bodies that appeared in the blood of convalescent animals and had succeeded in obtaining active immunization of guinea pigs with mixtures of living virus and convalescent serum and with formalinized killed tunica vaccines.

Since it is our purpose not only to give an account of our own work of the last three years, but to present as completely as possible all the information that has been gathered during this period on Mexican typhus, it will be necessary to restrict ourselves to the briefest tabulation of results consistent with clearness.

I. Problems of Etiology

Although crucial experiments are still lacking, there has been a gradually growing belief among bacteriologists that European typhus is caused by the Rickettsia provaceki seen in the intestinal cells of infected lice. Yet bacterial causes are still being described, filterable virus theories are advanced and there is a school of investigators who attempt to explain the mystery of the Proteus X–19 and the Weil-Felix reaction by assuming a cyclic relationship between these bacteria and the Rickettsia. The growing confidence in the Rickettsia as the true etiological agents, however, has become more and more justified by the accumulating circumstantial evidence brought forward by the painstaking and sound studies of experienced investigators like da Rocha-Lima, Weigl, Wolbach, Pinkerton and others. Our own belief that the bodies described by Mooser are Rickettsiae and are the etiological agents of Mexican typhus fever is based on the following facts, determined during the last three or four years:

1. The Mooser organisms resemble the R. provaceki in morphology, in intracellular position and in staining properties.

2. Like the R. provaceki these organisms are not cultivable except in the presence of living cells. The typical disease can be transmitted with such tissue cultures. (Zinsser and Batchelder;[3] Pinkerton and Haas;[4] Nigg and Landsteiner.[5])

3. Heavy intraperitoneal infection of male guinea pigs with some true European strains occasionally produces the scrotal swelling regularly observed with the Mexican strain. If the tunica scrapings from European guinea pigs are examined early in the disease (5th to 7th days), Rickettsia bodies, similar in position and appearance to the Mooser organisms can be seen. (Pinkerton;[6] Zinsser and Castaneda.[7])

4. The tunica material containing the Rickettsiae in the Mexican animals is many times more virulent than is the blood of the same animal. (Mooser; Zinsser and Batchelder, *loc. cit.*)

5. By special methods such as reducing the resistance of rats with benzol or X-ray treatment, considerable numbers of Rickettsiae can be obtained in peritoneal exudates. From these, the Rickettsiae can be washed free of cells and plasma and with such washed Rickettsiae the disease can be transmitted or immunity achieved. We regarded this as a crucial experiment. (Zinsser and Castaneda.[8])

6. Lice infected with Mexican tunica material by the Weigl method develop Rickettsiae identical in every respect to those seen in lice similarly injected with European virus. (Mooser and Dummer.[9]) Lice infected by the Weigl method with virulent suprarenal and spleen tissue from Mexican typhus guinea pigs (no Rickettsiae to be found in the injected tissues) develop Rickettsiae identical with those seen in European typhus lice and in lice infected with tunica material. (Castaneda and Zinsser.[10]) Guinea pigs infected with such lice develop the typical disease. Indeed, the virulence of the virus is stepped up by this procedure. Lice infected in this way with Mexican Rickettsiae succumb from the disease in from eight to twelve days, as do the European typhus lice.

7. Rat lice (Polyplax) allowed to feed on Mexican typhus rats develop the organisms characteristically. They can convey the disease to other rats by their bites; and injection of such lice into guinea pigs reproduces the typical disease. (Mooser, Castaneda and Zinsser.[11])

8. Fleas feeding on Mexican typhus rats develop Rickettsiae similar to those in lice and can transmit the disease to other rats by bite or by injection. (Dyer and collaborators;[12] Mooser and Castaneda.[13])

9. The following experiment has given us a great deal of satisfaction because of its simplicity and because it also throws a certain amount of light upon the European Rickettsia provaceki. It was carried out as a step toward our desire to compare the European virus and the Mexican virus against the identical biological background. We obtained detailed directions from Dr. Goodpasture regarding the method used by others and by himself for the cultivation of filterable viruses on the living embryonic membranes of fertilized hen's eggs. The method is simple, consisting in cutting a hole in the shell of a developing egg at about the sixth day, depositing virus material upon the ectodermal top layer, and closing with a coverslip stuck on with paraffin. Our results have not been published, but are ready for press. (Zinsser, Castaneda and Zia.[14]) By the method described, we obtained typical intracellular Rickettsiae in eggs inoculated with Mexican tunica material and also in eggs inoculated with spleen from a European typhus guinea pig. In position, Giemsa-staining and morphology the observed organisms are identical, except that those of the European virus seem somewhat smaller and appear to penetrate more deeply into the membranes. Guinea pig inoculation from parts of these egg membranes in each case gave rise to the disease which had furnished the egg inoculum. In the case of the European egg culture, the guinea pig developed abundant brain lesions, just as these are produced in animals inoculated with material from European patients or with louse Rickettsiae. This simple experiment seems to us of value not only as re-enforcing the etiological significance of the Mexican organisms, but also because it shows that Rickettsiae provaceki, hitherto seen in numbers only in the gut of lice, can be grown in typical form from virulent guinea pig spleen in which the organisms have not hitherto been found, probably because they are scarce and difficult to recognize by available methods when singly scattered in tissues or blood. The failure to find Rickettsiae in such virulent tissues has been one of the obstacles to complete acceptance. Our experiment among other things demonstrates the presence of Rickettsiae in European tissues by culture just as, in principle, this can be done for bacteria from materials in which the organisms are too scarce for direct morphological demonstration. The only alternative interpretation would be that the etiological agent was present in some other cyclic form in the tissues, and assumed

Rickettsia form in the egg culture, as it does in the louse. Such theories are held, cannot be denied, but should not be indulged in by serious investigators unless evidence forces them upon us.

II. Epidemiological Studies

In regard to the epidemiology of typhus fever, the last few years have also brought a considerable amount of information. It was shown in the early investigations of Mexican typhus fever of Ricketts that an insect vector was involved. Subsequent to the discovery of louse transmission by Nicolle in North Africa, Anderson and Goldberger and a number of other investigators demonstrated that the same insect was responsible for epidemic transmission of the Mexican disease from man to man. That typhus is always conveyed by the bite of an infected louse was generally accepted until 1926, when Maxcy [15] published an epidemiological study of cases clinically recognized as typhus fever, in the southeastern United States. The paper which Maxcy published in this year may be regarded as a classical example of the manner in which epidemiology carefully carried out can point the direction for laboratory efforts. Maxcy was struck by the fact that neither the environmental conditions nor the time distribution of the cases he studied warranted the assumption that the disease was kept endemically prevalent by louse transmission from man to man. Purely from the data revealed by his epidemiological survey, Maxcy suggested that the American type of the disease might be transmitted by some insect other than the louse and that an animal reservoir of the virus, probably in some rodent, might furnish the new sources of infection during interepidemic periods. Guided to a large extent by these suggestions of Maxcy, we [16] were studying the viability of the Mexican typhus virus in various insects, and found that it could be kept alive after intrarectal injection in bedbugs and in three varieties of ticks, but that with none of these insects was it possible to transmit by the natural process of insect bite. These investigations, however, had considerable interest in showing that the Rickettsia was not highly specialized to any one form of insect, but could survive for considerable periods, over two weeks, in insects far removed in zoological relationship from each other. We decided at this time to search for the typhus virus in the rats and mice prevalent in houses during a typhus epidemic, and arranged with

Mooser to carry out such a survey in Mexico City in the spring of 1931. At this time, Dyer [17] and his co-workers reported the recovery of typhus virus from fleas collected on rats in a typhus focus in Baltimore. In the latter part of April, with Mooser and Castaneda,[18] we obtained typhus virus of the typical New World type from the brains of two rats trapped in the Belem Prison in Mexico City, where the epidemic then prevailing had commenced. At the same time, it was found [19] that the Rickettsia developed easily in the intestinal linings of rat-lice feeding on infected rats and that this probably constituted one way in which the virus was kept going in a rat population. Very soon after this, Dyer and his collaborators—as well as Mooser and Castaneda in Mexico City [12, 13]—showed that the Rickettsia could live for considerable periods in the rat flea, and could be transmitted from rat to rat by this insect in the natural course of feeding. Moreover, the flea is much less vulnerable to the virus than the louse, the latter insects dying usually from six to eleven days after infection, whereas fleas may remain infected for as long as three weeks and eventually recover; conditions which have been studied both biologically and histologically by Mooser and by Dyer and his associates.

Apart from the complete circle of epidemiological transmission thus revealed for Mexican typhus, diverting the force of sanitary effort from mere louse disinfestation toward campaigns for rat extermination, these studies are of great biological interest. They point out a way of perhaps tracing the evolution of a disease and its varieties, by the adaptation of the causative agent to the bodies of various insect and animal hosts. It is already apparent that the flea manages to survive infection and eventually recover, that the rat and human lice are poorly adapted and succumb, and that ticks and bedbugs, though not demonstrably vectors are not capable of rapidly getting rid of Rickettsiae once they get in. It is not at all impossible that the different properties of the viruses of tsutsugamushi, Rocky Mountain spotted fever and the varieties of typhus may have evolved, through different insects and a variety of rodent hosts, from a single stock. Such a thought is rendered particularly pertinent by the considerable number of closely related but not entirely identical varieties of Rickettsia disease described within the last three years. We have considered these in some detail in another paper.[20]

It may be said in passing that since the uncovering of the rat reservoir in this country and in Mexico, similar observations have been made in Piraeus by Lepine [21] and in Toulon by Marcandier.[22] For the Tunisian and European diseases, no rat transmission has so far been found. It is of course possible that the population and living conditions in those foci are such that continuous louse-man passages can account for survival of the virus. Though conceivable, this would be curious.

III. Immunological Studies

In our preliminary work with Batchelder, we had confirmed Nicolle's observations in regard to the active immunization which could be obtained in guinea pigs with minute doses of living virus and with neutralized mixtures of virulent guinea pig serum and protective convalescent serum. We also had found that we could obtain a certain amount of immunity with killed formalinized tunica material of Mexican guinea pigs.

Methods of vaccination which depend upon living virus in a disease as dangerous as this cannot be expected to have much practical value and should be approached merely as a method of last resort if preparations of killed virus prove to be utterly insufficient. That vaccination in the Rickettsia diseases with killed virus may be possible was indicated in the work on Rocky Mountain spotted fever by Spencer and Parker,[23] and Weigl's method [24] of vaccinating with the killed suspensions of infected louse intestines had given promising results as a means of protecting against the European disease. This method is ingenious and Weigl deserves the credit of first proving with typhus the possibility of active immunization with dead virus. The principle revealed was that considerable concentrations of Rickettsiae are necessary to achieve this purpose, but the Weigl method necessitates the cultivation, infection and prolonged feeding after infection of lice, which requires the collaboration of typhus-immune individuals, much labor and a very complex laboratory organization. Our task was to obtain a sufficient accumulation of Mexican Rickettsiae, in order that a vaccine might be produced far richer than any that might be obtained even from the most virulent guinea pig tunicas. We accomplished this first by the benzol method and finally by a method now in use both by us and on a large scale by the Mexican Government, in which the resistance

of rats is broken down by a one-hour exposure to short wave length X-rays immediately after which they are intraperitoneally inoculated.[8] In such rats, the peritoneum is loaded with Rickettsiae after about five days. These organisms are intracellular in the lining cells up to the fourth or fifth day; then the cells burst and the Rickettsiae can be obtained, in the most successful rats, in suspensions almost as thick as the typhoid vaccine used for prophylaxis. With such suspensions we have carried out three types of experiments: (*A*) active immunization of guinea pigs, a procedure which is being followed up in man by Dr. Varela,[25] Dr. Casco[26] and Dr. Bustamante in Mexico; (*B*) the immunization of a horse for the purpose of possible serum preparation; (*C*) experiments in which, by washing these suspensions relatively clear of detritus we have been able to obtain preparations with which we were able to do agglutinations with European and Mexican convalescent sera and with which, by absorption experiments, we are trying to throw some light on the mystery of the Weil-Felix reaction and the antigenic relationship between Rickettsiae and the Proteus X–19 bacillus.

A. Active Immunization

We have carried out a considerable number of active immunizations in guinea pigs by intraperitoneal and subcutaneous inoculations of formalinized Rickettsiae vaccine produced as above described.[27] Since the work of all observers, ourselves included, has shown that European and Mexican typhus cross-immunize in guinea pigs, we have attempted to protect both Mexican virus animals and European virus animals. We have found that three injections of 0.5 to 1.0 c.c. of our vaccines completely protect guinea pigs against doses of Mexican virus which are fifty or a hundred times greater than the ordinary infecting dose. Our only failures have been in cases in which we increased the infecting dose to enormous amounts. With European virus, our protection has not been so regular, but from 30 to 50 per cent. of the guinea pigs inoculated with reasonably large doses of virus have been protected. This point is important, since it indicates, in spite of cross-immunization, a certain amount of antigenic difference between the two types of virus, a matter to which we will come back later.

As far as man is concerned, thousands of people have been vaccinated with this material in Mexico through the national Hygienic Institute of that country, but it will be a long time before results can be appraised. Casco has vaccinated and subsequently inoculated volunteers, and his results, though promising, include too small a number of persons to be of any conclusive significance. It will be some time before definite statements on the practical application of the vaccine will be justified. Nevertheless, of the greatest significance is the fact that a number of Casco's vaccinated individuals developed moderate Weil-Felix reactions, a phenomenon which hitherto has occurred only in animals and man recovering from active infection.

The X-ray rat vaccine production is relatively easy when systematized and yields from 10 to 15 c.c. of a thick vaccine per rat. We are hoping that some day cultivation either in tissue culture or otherwise may eliminate the necessity of using rats, but, meanwhile, this method is infinitely more simple and more practical than any insect method in our opinion, and relatively safe if carried out by an immune.

Dyer [28] has published some preliminary experiments in which he vaccinates with partial success with the killed intestinal Rickettsiae of infected fleas, a result which strengthens the underlying principles, but which we believe is subject to the same objections that can be brought against any method necessitating the use of insects.

B. The Immunization of a Horse [29]

As a result of the excellent yield of Rickettsiae obtained by the X-ray rat method and of the experience of all investigators with the protective properties of convalescent blood, we started in February, 1932, to immunize a horse with our killed Rickettsia vaccines. We found it extremely difficult to get any immunity at first, because the amounts injected were not adequate, yet by March 24th the horse had developed a Weil-Felix reaction which was strong in dilutions of 1–80 and definite at 1–160. Protection experiments done at this time with small amounts of serum mixed with tunica virus were promising but insufficiently so to necessitate report. After a long interval of rest, we resumed injection, with much larger amounts of killed Rickettsia, in May and continued until August. The last series of injections was

made intravenously. On August 15th, nine days after the last injection, a large amount of blood was taken from the horse. At this time the Weil-Felix reaction was + + + in 1–160 and definite but incomplete in 1–320. Normal horse serum never agglutinated our Proteus X–19 cultures in dilutions higher than 1–40. This in itself is very significant, since again with killed Rickettsia vaccine, a Weil-Felix reaction was produced, a fact which could be explained only by the etiological specificity of our Rickettsiae if one did not take the extreme, and it seems to us fantastic, view that through all these years of manipulation and in spite of all the evidence we have already adduced we had carried some invisible virus into our X-ray rats and multiplied it by the same methods that led to the multiplication of the Rickettsiae.

With the serum of this horse we were able to protect guinea pigs against the Mexican virus by a number of experimental variations.

When the serum and virus were mixed and allowed to stand before injection, 0.1 c.c. of the serum completely neutralized the virus when from four to ten infectious doses were used.

When the serum was given before the virus, subcutaneously, in doses of 1 c.c., it protected against moderate doses of the virus administered twenty-four hours and seven days after the serum. There was partial protection even after thirteen days. This type of experiment opens a possibility of prophylactic serum administration when a large group of people are exposed in a small epidemic.

Most encouraging is the fact that in well-controlled and repeated experiments it was found that 1.5 c.c. to 2 c.c. of the immune serum would prevent the development of typhus even when given subcutaneously one, two and three days after intraperitoneal inoculation of considerable doses of virus.

An important negative feature of these experiments is the fact that this serum had absolutely no passive protective effect against the European virus. In view of the unquestionable cross-immunization that can be carried out with living virus, in view of the results of active immunization and of the serum reaction to be described presently, this is extraordinary and again indicates definite differences between the two strains. The results being obtained in our laboratory at present in the comparative antigenic analyses of Rickettsiae and Proteus X–19 will, we

hope, give a clue that may explain the difficulty. We think that possibly it may be either a quantitative difficulty or that in the killing of the Mexican Rickettsiae some antigenic change has been produced. We have therefore continued to immunize the horse with living organisms from rats. This has shown some extraordinary things, namely, that although the horse had shown considerable protective properties after immunization with the dead organisms, it is getting very severe reactions from the inoculation with the living virus. These consist in fever, local swelling and a dependent edema in adjacent areas—which to us, as well as to the more experienced directors of the Massachusetts Antitoxin Laboratory appears similar to the reactions obtained with potent diphtheria toxin. It may well be that, as we suspected in our earlier vaccination experiments, the Rickettsia possesses a strong toxic element which the formalin treatment has attenuated in the killed vaccine. This certainly is the impression one gets both in observing and in having the disease. Protection experiments with the horse serum have not yet been done, as the treatment with living virus was begun.

C. Serum Reactions

With our own washed formalin rat Rickettsiae and with some of Weigl's louse vaccine we have carried out cross agglutination tests [30] against convalescent sera of both diseases and against the sera of guinea pigs and rabbits that have recovered from the disease or have been immunized. These experiments have given, in summary, the following important results:

Guinea pigs convalescent from Old World and New World typhus developed agglutinative properties for the rat Rickettsiae of the New World disease and for the louse Rickettsiae of the Old World disease.

The quantitative relations are such as to indicate that the two organisms are closely related but not antigenically identical, at least in the form in which they exist in the vaccine.

Human convalescent serum of both varieties of typhus develop agglutinins for both types of Rickettsia but, again, in quantitative relations indicating group reactions. Such convalescent Rickettsia agglutinations run parallel with the Weil-Felix reactions.

Rabbits immunized with the Weigl louse vaccine develop ag glutinins for the X-ray rat vaccines and vice versa. They also develop Weil-Felix reactions where, again, the group quantitative relationship is apparent.

These experiments seem to us to go far toward a final crucial etiological proof, and with the immunization experiments described above, they seem to us to furnish a hopeful and logical basis for both active and passive immunization in typhus.

In regard to the serum therapy, all our available serum which —as is apparent—cannot be produced in large quantities with our limited resources, has been sent to Mexico where a Government group is studying its effect in patients.

There is still an enormous amount of mopping up of details to be accomplished. One of the most encouraging and pleasing things about typhus investigation at the present time is the fact that the epidemiological and experimental work done by Maxcy and Dyer and others in Washington, the work done in other parts of the United States, and that carried out in the laboratory of Nicolle in Tunis, of Lepine in Athens and at the Pasteur Institute in Paris is all correlated and that there is a community of interest and mutual assistance among typhus workers throughout the world at the present time which will probably insure all of us from wasting much time in wrong leads.

Finally, we again call attention to the fact that while the Mexican and the European Rickettsiae are surely first cousins there is still a difference between them. Possibly this is the result of changes from adaptation due to different insect vectors or perhaps it is due to differences in animal hosts. We believe that further discussion would be simplified and a justified differentiation established if we named the Rickettsia first observed in the tunica of Mexican virus guinea pigs Rickettsia mooseri, to distinguish it from the Rickettsia provaceki of the European disease.

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ABSTRACTS OF THE PROCEEDINGS OF THE COLLEGE, FEBRUARY TO MAY, 1933

February 1

The Hypothalamus and Temperature Control. By H. C. Bazett, B. J. Alpers and W. H. Erb. (*Accepted for publication in the Archives of Neurology and Psychiatry.*)

Cats have been decerebrated at varying levels and have been kept under observation for several days or weeks. Animals with sections passing between the superior and inferior colliculi to the anterior end of the pons, have shown no capacity to regulate their temperature, to shiver, nor to develop a true polypnoea on exposure to warmth. On the contrary animals with a section passing from the inferior colliculi to the optic chiasma, leaving a portion of the base of the brain intact, have been able to control their own temperature at a normal level and to shiver on exposure to cold. However the only animal of this type tested in a warm environment did not develop any true polypnoea even though the rectal temperature rose to 43.2° C.; none the less some control was present, for on removal to a more normal environment the rectal temperature fell and was again regulated adequately when the normal level was reached.

The capacity to regulate body temperature and to show an apparently normal reaction to cold and subnormal reaction to warmth appeared to be correlated with the preservation of the hypothalamus just cephalic to the corpora mammillaria; this area included the nuclei surrounding the third ventricle and infundibular nuclei.

Shivering did not appear to be induced by normal stimuli through medullary centers, and evidence by other workers to this effect is considered to depend either on incomplete division of the brain stem or on irritation of lower centers by the lesion.

Discussion: *Dr. Alfred Gordon* referred to his study of elevation of temperature in patients following lumbar and cisterna punctures, reported two years ago before the College of Physicians, and showed how this finding can be correlated with Dr. Alpers' observations by postu-

lating withdrawal of fluid from the third ventricle. The area around the third ventricle may therefore be considered as a thermoregulatory center.

Dr. Alpers: While we are quite aware of the clinical cases that have been recorded, my experience in going over the literature with pathological records based on clinical experiences has been that the pathology in such cases has been so extensive that logical inferences concerning the thermal center have not been possible in most of the reported instances. If there is any evidence that the mesencephalon is necessary for temperature control I am not aware of it.

THE NERVOUS REGULATION OF BLOOD PRESSURE. By D. W. Bronk.

The activity of the heart and the smooth muscles in the blood vessel walls is continuously under a nervous control. In order to determine the mechanism of this regulation, the nerve messages have been recorded that go from the walls of the blood vessels to the central nervous system, and out from the cardio-vascular centers to the heart and blood vessels. This has been done by making electrical contact between the nerves that are under investigation and a vacuum tube amplifier which increases many thousand times the electrical potential change that accompanies each nerve impulse. This amplified potential then operates an electrical recorder which gives a photographic record of the impulses passing over the nerve. In order to obtain more accurate information regarding these mechanisms single nerve fibers have been dissected out of the trunks, thus making it possible to record the impulses coming from a single sense organ or from a single motor nerve cell.

Located in the walls of the carotid sinus and the arch of the aorta there are nerve endings which are sensitive to pressure. From these endings impulses are transmitted varying in number with the level of blood pressure. At low pressures only a few impulses are discharged at each systole. At high pressures, on the other hand, the discharge continues through diastole, and the individual impulses follow one another at more frequent intervals. A further effect of increased pressure is the bringing into action of more receptors. It may therefore be stated that the number of impulses going from these pressure-sensitive areas to the cardio-vascular centers in a given interval of time is a function of the level of blood pressure—the higher the pressure, the greater the number of impulses. This parallelism is followed with remarkable fidelity, the slightest variation in pressure being reflected in the number of afferent impulses.

Some of the effects of these afferent impulses as they play upon the centers have been studied by registering the afferent discharges of the sympathetic nerves to the blood vessels and the heart. The impulses to the heart from the stellate ganglion have, for instance, been photographed, and it is found that the heart is generally under a continuous tonic accelerator influence which is largely modified by variations in the number of impulses from the carotid sinus and aorta that result from variations in mean blood pressure. By these methods it is possible to obtain quantitative and objective information regarding the cardio-vascular centers and the role they play in the important reflexes controlling blood pressure.

Notes on a Series of Spinal Cord Tumors. By Francis C. Grant, M.D.

A series of twelve verified cases of spinal cord tumors was presented. In this series four tumors were situated extradurally, six within the dura but extramedullary, and two invaded and infiltrated the cord substance. In ten of these cases pain localized to one or more posterior root skin segments was an early and important symptom. In nine instances a more or less definite sensory level existed but in three no certain sensory changes could be determined. In eleven out of twelve patients the Queckenstedt test and protein content estimations of the spinal fluid gave important evidence of the presence of an obstructing lesion. In five instances campiodol was injected into the spinal canal to determine with accuracy the level of the lesion. In four subjects the opaque oil showed the level of the tumor on the X-ray film. Six of these patients were completely cured following operation over periods extending from two to ten years. Three were greatly improved, two improved and one died from pneumonia following surgical removal of the tumor.

March 1

Agranulocytic Angina (Pernicious Leukopenia): A Study of Eighteen Cases with Nine Necropsies. By Thomas FitzHugh, Jr., A.M., M.D., and B.I. Comroe, M.D. (*Published in Am. Jour. of the Med. Sciences, 185: 552, 1933.*)

A summary of the outstanding features in our cases is as follows: *Age incidence* 19 to 78 years: *Sex,* 60 per cent males:

Classification and *outcome,* 60 per cent (11 cases) "acute" with only one living (cured 3 years)—mortality 90 per cent plus; 29 per cent (5 cases) "chronic continuous" with one living—mortality 80 per cent; 11 per cent (2 cases) "chronic remittent" both living (one "cured" 18 months); total mortality 78 per cent: *Treatment Results,* X-ray—6 cases, 4 dead; transfusions —14 cases, 12 dead; pentose nucleotide—5 cases, 5 dead: *Autopsy Findings,* splenic enlargement (200 to 400 gms.)—7 cases; hepatic enlargement (slight)—3 cases; gastrointestinal and orthopharyngeal ulceration—18 cases; vaginal ulceration—1 case (of 3 females); bone marrow myeloblasts normal or hyperplastic in 8 cases. Polymorphonuclear neutrophiles in tissues totally absent in 8 cases.

We believe this condition is analogous to pernicious anemia in certain respects and therefore prefer the designation *pernicious leukopenia,* which is also preferable on etymologic grounds. It seems to be an "entity," of unknown etiology, with an apparently uniform mechanism, and fairly characteristic clinical course. It seems to present, during the active phase, a phenomenon of "arrest of maturation" of the white cell elements at or near the blast level of development in the leukopoietic centers (especially in the bone marrow) with consequent profound peripheral leukopenia (especially granulocytopenia). Following upon these hematologic disturbances there is a peculiar tendency to ulceration and necrosis of mucous membrane and other tissues and subsequent local and systemic invasion by bacteria. Death may occur without demonstrable septicemia if the "maturational arrest" is maintained but terminal sepsis is not uncommon. Remission is initiated by release of the "arrest factor" in a way apparently analogous to remissions in pernicious anemia.

Discussion: *Dr. H. W. Jones* suggested there may be different types of this disease according as the bone marrow is hyperplastic, normal, or aplastic; also types with acute onset without anemia, others more chronic and a third type with anemia not produced by hemorrhage though hemorrhages may subsequently occur. He emphasized the importance of obtaining both white cell count and differential in every case of throat infection or grippe that lasts longer than the ordinary case.

Dr. Fitz-Hugh: I agree with Dr. Jones that it is unimportant to discuss whether agranulocytic angina is a disease entity or a syndrome with a uniform mechanism. I think it is, at least, the latter. The conflicting evidence in regard to the bone marrow is due to several causes: one is the variable stages of the disease at which the bone marrow comes under observation. If the individuals survive long enough to

attain the stage of necrosis of course the marrow will be "aplastic." Another cause for the divergent bone marrow findings is the mistake, which is often made, of calling myelocytes and myeloblasts, lymphocytes. Cases of leukopenia with early marked cryptogenic anemia we feel belong in that well known category of aplastic or panmyelophthisic anemia rather than to this syndrome. We have two cures, one three years and one eighteen months, and two in the chronic remittent group are still living (out of our eighteen cases). We have not observed the myelocyte crisis that has been described by Doan, Henry Jackson, Jr., and others. We would like to see it because it fits in with our hypothesis of maturational arrest, and helps to complete the analogies between pernicious anemia and this disease which we prefer to call pernicious leukopenia.

Recent Observations on the Regulation of Gastric Motility: the Influence of Normal Intestinal Filling. By J. Earl Thomas, M.D. *Discussion by Dr. H. C. Bazett.*

Studies on the Conservative Treatment of Peripheral Vascular Disease. By Isaac Starr, Jr., M.D. (*Amer. Jour. Med. Sci., 1933, in press.*)

When the feet of a patient suffering from advanced peripheral vascular disease are immersed in cold water and the temperature slowly raised, a zone of temperature is discovered within which the circulation of the feet, judged from the skin color, is at a maximum and pain is diminished or relieved completely. A further increase in temperature causes increased pain and cyanosis. The mid point of the zone of optimum temperature is 34° C. Apparatus designed to maintain this temperature about the feet of patients has been made at the University of Pennsylvania shop and has been in use at the University Hospital during the last three years. All patients agreed that they were far more comfortable in this thermo-regulated cradle than the heated cradles used previously. We have also obtained evidence that healing is increased by maintenance of this optimum temperature.

The drug, acetyl-β-methylcholine, a powerful vasodilator, first synthesized by R. T. Major and identified as a promising pharmacological agent by Simonart, has been used in the treatment of certain types of peripheral vascular diseases. Four cases of Raynaud's disease reported considerable symptomatic relief when they took the drug during cold weather. Certain cases of the

obstructive type of peripheral vascular disease showed a rise of skin temperature and relief of pain after taking the drug. In other cases the drug failed to raise the skin temperature or to provide relief of pain.

Discussion: *Dr. T. A. Shallow* presented two patients, one a woman of 43 with scleroderma of the right hand somewhat improved following cervical sympathectomy, the other a young woman with Raynaud's disease of the feet and hands of 12 to 15 years' duration, markedly benefited by bilateral cervical sympathectomy.

Dr. Starr urged a trial of drug therapy in vasospastic conditions before resorting to surgery.

Pulmonary Atelectasis: The Importance of Roentgenology in the Differential Diagnosis. By Willis F. Manges, M.D., and John T. Farrell, Jr., M.D. (*To be published in Am. Jour. Roentgen. and Radium Ther.*)

Atelectasis is due to complete bronchial occlusion, the most common cause being plugging of the bronchus from within, though occlusion from external pressure does occur when mediastinal tumors or lymph nodes enlarge after they have become *fixed* to a bronchus, and in rare instances occlusion from maldevelopment may be congenital and present at birth.

The roentgen ray signs of atelectasis are: increase in density of the atelectatic area; displacement of the heart and mediastinum to the side of involvement; and elevation of the diaphragm on the affected side. The extent of the area of increased density depends upon the size of the bronchial branch occluded, and upon changes developing in the lung distal to the occlusion. The degree of mediastinal displacement and height of diaphragmatic elevation are also determined by the size of the bronchus occluded.

For diagnosis of the condition repeated roentgen examinations may sometimes be necessary, and in some cases all available clinical and laboratory data may be required for determination of the etiologic factor.

The full paper outlines concisely: (1) the mechanics and general incidence; (2) the clinical significance; (3) the clinical characteristics; and (4) the roentgenologic characteristics of atelectasis due to various causes.

Discussion: *Dr. E. P. Pendergrass* did not believe that true atelectasis shows maximal density on the roentgenogram. When maximal density of the affected side occurs he thinks that there is a superim-

posed drowned lung. The importance of taking lateral views of the chest in this and other chest conditions was stressed.

Dr. L. H. Clerf emphasized the importance of the history in arriving at an etiologic diagnosis. The wheeze sometimes heard with atelectasis due to air passing through a narrowed orifice disappears when the obstruction completely obliterates the orifice. In a number of cases after correlating the findings secured by history, thorough physical examination and roentgen study lacking information can be contributed by bronchoscopy.

March 23

Cancer—A Community Health Problem. (Abstract from the Mary Scott Newbold Lecture. Lecture XXIX.) By Burton J. Lee, M.D., Memorial Hospital, New York City. (*Bull. Amer. Soc. for Control of Cancer*, 1933, No. 5.)

The antiquity of cancer has been proven by the discovery of tumors in fossil bones antedating the age of mammals. From the earliest medical document through all the succeeding centuries, the problem of cancer has compelled the attention of the leaders of medical thought. A brief recital of the evolution of cancer knowledge is given with special reference to the contribution of the physicians and surgeons of Philadelphia.

The rôle of heredity and the influence of age on the incidence and prognosis of cancer is briefly discussed. Various precancerous lesions are described together with other factors influential in the prevention of cancer. The curability of cancer is stressed with an enumeration of some of the cancers which can be cured providing the diagnosis is made early and appropriate treatment instituted.

The increase in the incidence of cancer has been attributed to (*a*) an apparent increase because of more accurate diagnoses, and (*b*) an actual increase in frequency because of the greater average span of life. A comparison of the cancer mortality in the five largest cities in America in 1931 has shown the rate to be highest in Philadelphia. This excessive death rate from cancer in the city of Philadelphia (133.3 per 100,000) stimulates serious thought as to community responsibility.

The economic aspect of the cancer problem is worthy of grave consideration. The loss of earning power of those who died of cancer in Philadelphia in the year 1931 was 1,463,400 working days. The hospitalization of the cancer patients in Philadelphia

for the year 1931 cost a half million dollars. The loss in economic value to the community of those who died is upwards of $32,000,000.

The facilities for the treatment of cancer in Philadelphia have been reviewed in detail. The total supply of radium now employed in cancer therapy in this city is more than eleven grams. But in spite of this excellent service to cancer patients in these hospitals, cancer clinics and private radiological offices throughout Philadelphia, the cancer program here demands the leadership of a thoroughly organized complete cancer institute. Under proper leadership it would affiliate all men in the city interested in the science of oncology, promoting discussion and an intelligent interchange of viewpoints with the result that the whole effort for those afflicted with cancer would reach a higher point of effectiveness. The activities of such an institute are threefold: (1) Cancer research; (2) cancer service (diagnostic and therapeutic service to the cancer patient); (3) education of the medical profession. The ways and means by which these activities can be organized and effectively directed have been dealt with in some detail.

April 5

Aggressive Phases of the Chorionic Epithelium, Physiologic and Pathologic. By Thaddeus L. Montgomery, M.D.

A brief outline of the life cycle of the chorionic epithelium is presented, beginning with the trophoblastic stage and extending up to the period when the epithelial covering of the villus loses its identity. Special attention is directed to the fine balance which exists in the normal pregnancy between aggressive and regressive activity, particularly as they affect the nutrition and vitality of the embryo and the protection of the mother.

The influence of heredity upon a growth activity of the chorionic epithelium is demonstrated in the regressive lesions that are found in the necrosis of the placenta. These same hereditary influences are pointed out in the case of aggressive lesions. It is demonstrated that these hyperplastic conditions of the chorionic epithelium differ from each other only in degree of growth activity. While benign hydatidiform mole clearly represents one extreme and malignant chorionepithelioma the other, the inter-

vening types of growth are not susceptible of definite classification. The presence or absence of the villous stroma upon histologic examination of the lesion appears to be no criterion of malignancy.

The cell types in the individual case are found to be rather consistent from the time of first manifestation of the lesion until the termination. Edema is often present in the villous stroma, but is not necessarily a part of the histologic appearance. The most evident etiologic factor in the production of aggressive lesions appears to be the peculiar hereditary constitution of the fertilized ovum.

The degree of malignancy of chorionepithelioma can not be determined by the histologic appearance of growth alone, although marked hyperplasia of Langhans' cells and the syncytial elements is always significant. Indeterminable factors of local and general resistance in the maternal host occupy an important rôle in the spontaneous regression of some of these growths.

Discussion: *Dr. C. C. Norris* agreed that the difficulty of diagnosing malignancy from the curettings in cases of chorionepithelioma is especially great.

Dr. W. R. Nicholson stated that his study of secondary rupture in the uterine scars of previous caesarian sections led him to infer that a large number of these cases are due to deep perforation of the syncytial cells.

The Clinical Application of the Recent Advances in Female Endocrinology. By Franklin L. Payne, M.D.

The subject matter includes a brief consideration of the endocrinology of menstruation and pregnancy and the clinical application of our knowledge concerning these processes. The recent advances in this field are of practical value in the diagnosis of pregnancy and its complications: hydatidiform mole and chorionepithelioma. In the study of amenorrhea and functional sterility, the hormone tests aid in determining the type of glandular aberration which prevails. In the treatment of functional disorders, hormone therapy has definite limitations. It is occasionally effective in amenorrhea but rarely, if ever so, in functional sterility. The most satisfactory results are seen in the treatment of functional uterine hemorrhage, particularly in young women, but here it is by no means universally effective.

Discussion: *Dr. C. C. Norris* expressed the hope that the Aschheim-Zondek test may prove valuable as an aid in recognizing malignant and certain other tumors of the ovary and recurrences following operation.

Post-Menopausal Bleeding. By Howard C. Taylor, Jr., M.D., New York.

Bleeding after the menopause is the predominant symptom of a wide range of diseases. Some of these are rare and of chiefly scientific interest, while many, although common, are of minor clinical importance. All other aspects of the subject are overshadowed by the frequency with which bleeding is due to malignant tumors.

The material upon which this paper is based consists of 298 cases of post-menopausal bleeding treated by the Roosevelt Hospital Gynecologic Service during the ten year period from 1921 to 1930. Of this group 188 or 63 per cent were due to malignant tumors, the frequency being almost exactly the same whether the bleeding had developed in the fifth, sixth or seventh decades. The important factor in predicting the probable presence or absence of malignancy in a given case is not the actual age of the patient but her physiologic status in relation to the menopause.

That two thirds of the cases which enter hospitals for post-menopausal bleeding are suffering from genital cancer is indicated by several series prior to the present one. Such hospital figures appear to somewhat overstate the proportion of malignancy and a review of 188 cases of post-menopausal bleeding observed in a gynecologic office practice showed that here the incidence of malignancy was only 37.7 per cent. In the office of the general practitioner the figure may be still lower but undoubtedly remains high enough to keep the fear of cancer uppermost in the mind of any physician called upon to treat a case of bleeding after the menopause.

Benign lesions were responsible for the bleeding in 110 cases. These cases may be considered in three principle groups.

1. Bleeding from visible inflammatory lesions of the vagina and cervix was responsible for 32 cases, divided as follows: Senile vaginitis, 7; prolapse of the uterus with erosion or ulceration of the cervix, 15; simple erosion of the cervix, 10. These lesions are of importance only in that their presence may be accepted errone-

ously as an adequate explanation of bleeding and a more important lesion be overlooked.

2. Benign tumors were present and the apparent cause of bleeding in 52 cases which were divisible as follows: Cervical polyps, 11; endometrial polyps, 5; fibromyomas, 28; ovarian tumors, 4; urethral caruncles, 4. Fibroids were thus the most important type of benign tumor causing post-menopausal bleeding, a somewhat unexpected finding. On close analysis it was found that some special complication such as degeneration or a submucous position, or some associated condition such as a polyp or a hyperplasia were usually necessary to produce bleeding in patients with fibroids. Three of the ovarian tumors were associated with hyperplasia of the endometrium.

3. Bleeding from grossly normal uteri occurred in 26 cases, for which the following causes may be suggested: Late ovulation, 2 cases; endometritis from cervical stenosis, 1 case; venous congestion from prolapse of the uterus, 8 cases; hyperplasia of the endometrium, 5 cases; origin entirely unknown, 10 cases. One case of hyperplasia was observed in a woman of 58, thirteen years after her menopause.

The problem of treatment centers upon a complete diagnostic procedure including first a careful physical examination; secondly, a thorough curettage with exploration of the entire uterine cavity; thirdly, an adequate pathologic examination with the histologic study of several areas of tissue. Except where an obvious cause of bleeding is found at once, none of these steps should be omitted.

Discussion: *Drs. C. C. Norris, W. R. Nicholson and G. W. Outerbridge* emphasized the importance of examination of all the tissue curetted in these cases in order to detect early malignancy. Dr. Nicholson criticized the practice of removing polyps without subjecting them to careful histological examination. Dr. Outerbridge described the divergence of opinion of competent pathologists with respect to malignancy judged from essentially similar slides from the same block of tissue in cases of uterine invasion by syncytial elements.

Dr. Catharine Macfarlane regretted that Dr. Taylor emphasized the importance of myomatous tumors of the uterus rather than some complication thereof such as hyperplasia of the endometrium or cystic tumors of the ovary as a cause of post-menopausal bleeding.

Dr. Taylor: There were 28 cases of fibroids which I listed. Of these, ten were submucous in position, with the bleeding coming definitely from the fibroids. With respect to several of the others I think the criticism may be correct that the bleeding was not directly from the tumors but from an associated condition, such as a

polyp or a hyperplasia of the endometrium. There were, however, four beside the submucous tumors in which no cause other than the fibroid was to be found.

In regard to cancer developing from a polyp, a distinction must be made between the cervical and endometrial types, the latter being apparently much more prone to malignant change.

May 3 and 5, 1933

Observations on the Prognosis of Heart Disease. (Abstract from the Mary Scott Newbold Lecture. Lecture XXX.) By R. T. Grant, M.D., M.R.C.P. (*The Department of Clinical Research, University College Hospital Medical School, London.*)

The work on which these lectures is based has been carried out since the war in the Department of Clinical Research, University College Hospital Medical School, London, and a full account will be published in *Heart,* 1931–33, xvi, 275.

Previous observations, made by Sir Thomas Lewis and his colleagues during the Great War, tended to show that the after-histories of men suffering from derangements of the cardiovascular system are to be foretold not so much by the presence or absence of signs of valvular disease, or by the type of valvular disease thought to be present, but rather by the degree of cardiac enlargement and the grade of cardiac failure. From this point of view, the after-histories of 1,000 men, all war pensioners and suffering from heart disease, have been followed for a period of 10 years. According to their original state, these men were classified from two aspects, (*a*) valvular defect and etiology and (*b*) degree of cardiac enlargement and grade of cardiac failure.

At the end of the tenth year, 514 of these men remained alive, 473 had died, while only 13 were untraced. One of the most striking features of the after-histories is the large proportion of cases (at least 22 per cent) who lived throughout the 10 years uneventfully and without change in the physical signs of heart disease. Other chief features are the development of congestive failure, of auricular fibrillation and of subacute bacterial endocarditis.

The correlation of after-history with original classification shows that prognosis is most accurate when it is based, not on valvular defect, but on the two chief and related factors of cardiac

enlargement and heart failure or when the estimate on this basis is modified by associated findings.

On this basis, the cases fall into three main groups: (1) Prognosis good—cases with little or no cardiac enlargement and good or fair exercise tolerance; only 21 per cent died within 10 years, while many lived uneventfully and unchanged. (2) Prognosis poor—cases with moderate enlargement and poor exercise tolerance; about 50 per cent died. (3) Prognosis bad—cases with great enlargement or signs of congestive failure; almost all died within 10 years.

This general forecast of death is but little modified by the type of valvular lesion present. The chief information derived from the recognition of the valvular lesion is liability to: (*a*) sudden death in aortic regurgitation, but not in mitral stenosis; (*b*) the development of bacterial endocarditis in association with non-syphilitic aortic regurgitation; (*c*) the development of auricular fibrillation in association with mitral stenosis; (*d*) the occurrence of aneurysm associated with syphilitic aortic regurgitation.

When fibrillation, endocarditis or aneurysm is present, they influence unfavorably the general prognosis based on enlargement and failure; but here again, at least in fibrillation and bacterial endocarditis, enlargement and failure influence the forecast.

These observations show also that the outlook for patients suffering from valvular defect is not so bad as it is generally thought, even in the case of syphilitic aortic disease, and that in a large number of cases the fear of an early death aroused by a diagnosis of heart disease can be confidently allayed.

PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY, JANUARY TO APRIL, 1933

(*These proceedings will appear in abstract in the Amer. Jour. Ophthalmol. and in the Archives of Ophthalmol.*)

January 19

Dr. Geo. Cross and Dr. Chas. R. Heed: "Exhibition of a Case of Ectropion Following an Explosion."

Dr. Edward A. Shumway: "Report on a Case of Erythema Multiforme." Discussion by: Dr. Weidman, Dr. Greenbaum, Dr. Herman, Dr. Wood, Dr. Buchanan and Dr. Langdon.

Dr. H. Maxwell Langdon: "The Use of Adrenalin in Ophthalmology." Discussion by: Dr. Shannon.

Dr. James S. Shipman (by invitation): "Coloboma of the Optic Nerve."

Dr. Nathan B. Stauffer (by invitation): "Eye Lesions Caused by Sinusitis." Discussion by: Dr. Langdon, Dr. Heed, Dr. Holloway and Dr. Stauffer.

Dr. J. B. Feldman (by invitation): "Demonstration of a New Pupillometer and Illuminometer." Discussion by: Dr. Holloway.

Dr. F. A. Faught (by invitation): "Medical Economics."

February 16

Dr. Walter R. Parker, Detroit, Mich. (by invitation): "The Results of Cataract Extraction by the Simple, Combined, and the Intracapsular Method: Based upon 150 Cases by Each Method."

Dr. Arnold Knapp, New York, N. Y. (by invitation): "Some Features of the Intracapsular Extraction."

Dr. E. C. Ellett, Memphis, Tenn. (by invitation): "The Use of a Corneal or Conjunctival Stitch in Cataract Extraction." Discussion by: Dr. T. B. Holloway, Dr. C. E. G. Shannon, Dr. Luther C. Peter, Dr. L. F. Appleman and Dr. Frederick Krauss.

March 16

Dr. C. E. G. Shannon: "Paralysis of External Rectus Following the Extraction of a Tooth."

Dr. Francis H. Adler: "Disciform Degeneration of the Macula." Lantern Slides. Discussion by: Dr. Thornwall Davis and Dr. Holloway.

George E. Berner (by invitation) *and Dr. Francis H. Adler:* "Ectasia of the Cornea in Keratoconus." Lantern Slides.

Dr. H. Maxwell Langdon: "Fusion Training in Concomitant Squint, with Special Reference to the Amblyopia."

Dr. Le Grand Hardy, New York, N. Y. (by invitation): "The Orthoptic Clinic of the Fifth Avenue Hospital."

Mrs. Winifred Hathaway, Associate Director of the National Society for the Prevention of Blindness, New York (by invitation): "A Layman's Observation of the Maddox Clinic." Discussion opened by: Dr. Griscom and Dr. Holloway.

April 20

Dr. E. A. Shumway: "Final Report on a Case of Erythema Multiforme."

Dr. Hunter Scarlett: "Recurrent Edema of the Lids Associated with Dental Infection."

Dr. C. E. G. Shannon: "Paralysis of the Superior Oblique Following Sinus Operation: Corrected by Recession of the Inferior Rectus on the Opposite Side." Discussion by: Dr. Shumway and Dr. Zentmayer.

Dr. G. E. deSchweinitz and Dr. Perce De Long: "Concerning Neuro-Lymphomatosis Gallinarum, being a Brief Pathological Study of the Ocular Lesions." Discussion by: Dr. G. A. Dick, Dr. E. L. Stubbs, and Dr. T. B. Holloway.

Dr. Edmund Spaeth: "Certain Factors in the Surgical Anatomy of the Lacrimal Sac."

Dr. T. B. Holloway: "Ocular Manifestations in a Series of Fibroblastomata." Discussion by: Dr. Frazier.

PROCEEDINGS OF THE SECTION ON OTOLOGY AND LARYNGOLOGY, JANUARY TO MAY, 1933

January 18

Frontal Lobe Abscess (Multiple): Secondary to Frontal Sinusitis. With Report of a Case. By Dr. William Gordon.

Mortality is high, about 75 to 80 per cent, according to Eagleton. Compared to brain abscess of otitic origin, that from nasal origin is less common in spite of the greater prevalence of suppuration in the nose. This, as explained by Eagleton, is due to the nasal mucous membrane acting essentially as a protection while the mastoid mucous membrane is merely a covering. Trauma renders brain tissue more susceptible to infection. The principal symptoms are: Initial vague chill, coincident with infection of brain tissue; headache, unrelieved by medication and becoming progressively worse; vomiting; slow pulse or even Macewen's sign, where a marked dip is followed by return to normal rate (this is thought to be due to transient cerebral edema); subnormal temperature; papilloedema; cerebrospinal fluid changes; convulsions and finally coma.

Anatomical relations show various protective barriers but as indicated by Zwillinger and others the path of infection from the frontal sinus to the brain may be by continuity or through perforating blood and lymph spaces which provide intimate relationship.

Treatment depends virtually upon consideration of the methods of drainage. Approach is usually through the infected area, respecting adhesions in the subarachnoid space and establishing a cofferdam before entering the abscess. Operators differ widely in their technique.

The case reported was a boy of eleven. Both frontal sinuses were diseased but the right one had a necrotic inner wall. Two deep abscesses in the right frontal lobe were opened and at autopsy one led into the lateral ventricle.

Discussion: *Dr. Geo. M. Coates:* Persistent headache with infection of sinuses or ears is suspicious of intracranial lesion. History of

trauma, recent or remote, is usual in frontal lobe abscess. Best approach is through the frontal sinus no matter from where the cause comes.

Dr. Benjamin Shuster: Vestibular tests here were against the rule. The high mortality is usually due to meningitis.

THE INTRAORAL DRAINAGE OF SUBLINGUAL INFECTION. (LUDWIG'S ANGINA). By Dr. Karl M. Houser.

In 1836 Ludwig published his observations on the oral inflammation that later bore his name, but it was not until the twentieth century that it was considered a disease entity. The disease is not common; 12 in 18,705 or 0.07 per cent incidence occurred at the Hospital of the University of Pennsylvania. Definitions all agree that it is a cellulitis of the floor of the mouth above the mylohyoid muscle but may show submandibular involvement. Board-like hardness under the mandible and swelling of the floor of the mouth, pushing the tongue up and back are the principal diagnostic signs. Later edema of the larynx and pus in the neck appear after extension between the hyoid bone and the inner side of the mandible. From Blassingame's ink injections it was concluded that infection from the posterior teeth or that part of the jaw was responsible for the involvement. Clinical histories showed dental caries in 11 of 18 cases in Ashhurst's series. It is remarkable that more attention has not been given to intraoral operation. In 17 cases of spontaneous evacuation Thomas reported all opened intraorally.

Three cases here reported recovered after rupture or incision intraorally.

DISCUSSION: *Dr. Benjamin Parrish:* "What guides you in the time for incision?"

Dr. Geo. M. Coates: "Is Ludwig's Angina always due to dental caries? Two cases seen in consultation showed peritonsillar abscess. Could this be the cause?"

Dr. Warren Davis: One case associated with abscess around a large stone in the sublingual duct was relieved by intraoral drainage and removal of the stone. The rule at Jefferson Hospital is intraoral drainage unless pus is outside the mylo-hyoid muscle.

Dr. Houser: Time of incision is judged by symptoms and bimanual palpation with finger inside and outside of the mouth. Regarding etiology, 85 per cent are reported as due to dental caries.

MASKED MASTOIDITIS. By Dr. William Hewson and Dr. John Eiman.

Masked mastoiditis is a cloak to hide ignorance, but the discovery of pus in the tympanum and mastoid at autopsy when careful examination by competent aurists pronounced ears negative make this term still applicable.

Three cases are reported: The first of clinical meningitis of unknown origin followed by bilateral mastoiditis, pneumococcic septicemia and recovery. The second of hemolytic streptococcic meningitis with ear drums appearing normal yet autopsy showed pus in both mastoids and middle ears. The third of hemolytic streptococcic septicemia with ears and mastoids appearing normal yet autopsy disclosed pus in both mastoids and middle ears yielding *Streptococcus hemolyticus* on culture. There was also an organized thrombosis of the superior longitudinal sinus.

DISCUSSION: *Dr. Addinell Hewson:* Transmission of infection through the mastoid to the inside of the cranium may be: first, as in babies, through non-united ossification sutures; second, through normal dehiscences existing for the passage of blood vessels and lymphatics; and third, through abnormal dehiscences, which may occur anywhere on the intra-cranial surface of the temporal bone.

Anatomical survey of the venous circulation about the head shows intimate communication between those vessels outside of the cranium, those within the cranial bones and those in the meninges by emissary veins emptying for the most part into the superior longitudinal sinus, lateral sinus, cavernous sinus, torcular herophili, et cetera. Slowing of the circulating blood in these large blood sinuses is facilitated by their maintained patency and the presence of intra-sinus ligaments and pacchionian bodies, thus encouraging the thrombosis discovered in the third case of this report.

FEBRUARY 15

OTITIS MEDIA IN SCARLET FEVER. By Dr. Horace J. Williams.

The object of this paper is to present the aural complications in scarlet fever from 1922 to 1929 at the Philadelphia Hospital for Contagious Diseases. On account of the municipal ownership of the institution, the overwhelming bulk of patients was from the less well-to-do classes and therefore many suffered from inadequate hygiene, nourishment and medical care.

From 14,733 patients with scarlet fever, 10.8 per cent developed suppurative otitis media. About 10.8 per cent of these

again died in spite of operation. Early incision of bulging drums and incision of ruptured ones with improper drainage tended to lower the incidence of surgical mastoiditis. Repeated incision was found to be of little value. 91.5 per cent of 1,535 patients with acute suppurative scarlatinal otitis media occurred in children under 10 years of age. Aural complications of any severity were found to occur at any time from the first day of illness to the last day of convalescence. That the presence of tonsils and adenoids seemed to predispose to aural complications is indicated by the low percentage (6.8 per cent), of instances of removal in this series of 14,733 cases. There seemed to be no great tendency for extension from the bone to meninges as only 7 patients had meningitis.

Sinusitis in Infancy and Early Childhood. By Dr. Walter L. Cariss.

Opinion as to the frequency of occurrence, methods of diagnosis, prevention and treatment are at wide variance. The discrepancy as to incidence of sinusitis is doubtless due to difference of opinion as to what constitutes sinusitis. Aids in diagnosis are limited. History and symptomatology are uncertain. Direct inspection is often difficult. Bacteriologic and cytologic studies are hard to accomplish for the same reason, though Dean reports them of much aid. X-ray pictures must always be correlated with other findings and are hard to obtain. Transillumination is of much less value than in adults. Nasopharyngoscopic examination, on the other hand, is of much assistance and usually readily made. Complications are frequently present; orbital abscess or cellulitis is not an uncommon one, as shown by the three cases reported.

Treatment should vary with the case. A vitamin "A" diet is valuable in stimulating the mucous membrane against infection and in aiding recovery. Cody reports that avitaminosis presents essentially the same nasal symptoms as infection. Concerning local treatment, there is unanimity as to the necessity for aeration and drainage but the value of drugs, oils, bacteriophages, et cetera, locally is much in dispute. Surgery should be as conservative as is possible with thoroughness but our best line of

defense is preservation of the normal ciliary action of the nasal and sinus mucosa.

Spontaneous Cerebrospinal Otorrhea. By Dr. Oram R. Kline.

It has long been known that cerebrospinal fluid may escape from the ear after fracture of the skull but literature dealing with spontaneous cerebrospinal otorrhea is very meager. St. Clair Thompson, Canfield and Roth present the only case records resembling the one in this report.

A man, 54 years old, complained of watery discharge from his right ear, starting three hours previously and preceded by stooping. Previous history states that suppurative otitis media at 9 months with erysipelas resulted in slight deafness in this ear, though there was no prolonged suppurative discharge. There was no other pertinent illness until the two months before when his family noticed some impairment of his memory. Examination was generally negative except for the right ear, inspection of which was interfered with by exostoses and the continued flow of a clear watery discharge. Coughing increased the flow. About 3 c.c. were collected and reported by the laboratory to be characteristic of cerebrospinal fluid. There was no gross loss of hearing. In four days, the discharge gradually stopped and he felt well. He then became restless and developed a temperature of 103°, a chill, nausea and severe frontal headache. Stiffness of the neck followed with suggestive Kernig's sign. The ear drum then showed no inflammation but a blisterlike swelling which, when broken, allowed clear fluid to flow again.

Autopsy showed suppurative exudate over the vertex and frontal lobes with some involvement of the vermis. Pneumococci were obtained from culture. On the superior surface of the right temporal bone between the arcuate eminence and petrosquamous suture, was a 2½ mm. circular opening in the dura and bone. The dura surrounding this was smooth and dipped into the opening. A probe passed through it entered a fistulous tract into a sac attached to the posterior bony wall of the tympanum. No signs of inflammation were found in the mastoid. It was thought the fistula might be the duct of a congenital brain cyst, though the meningitis probably came from some sinus or other origin.

Dermoid Cyst of the Nasal Dorsum. By Dr. Romeo A. Luongo.

The rarity of this condition led to the following case report.

A married woman of 30 years complained of discharge of bloody pus and hairs from a small fistulous opening on the dorsum of her nose. She had always noticed that the upper portion of her nose was broadened and elevated but 6 years before the elevation increased considerably. Probing revealed a cavity extending about 2 cm. upward, 1 cm. downward and ½ cm. laterally. Intranasally only a thickening of the septum was seen in this region. Palpation indicated a soft, fluctuating area about 2 cm. square, extending between the nasal bones, which were separated about 1 cm. The slightest touch induced a discharge of bloody pus and hairs from a pin point opening at the lower border of the nasal bones. Lipiodol injection and X-ray showed the cavity to be limited to the area explored and at operation the cavity was seen to occupy a bony nest, the size of an olive. A sac was differentiated, containing cheesy material and loose hairs. Microscopically, the specimen consisted of squamous epithelium overlying fibrous and fatty tissue, containing sebaceous glands and hair follicles.

Dermoid cysts located in the areas of the embryonal fissures (orbito-nasal, mandibular fissure, et cetera) are usually formed by sequestra of the surface epithelium during the closure of the fissures. In this locality without any fissure, it is believed that, during the separation of the skin from the cartilage of the fronto-nasal plate by the intrusion of the nasal bones, small portions of the skin become sequestered and developed into dermoids.

Discussion: *Dr. O. V. Batson:* I was impressed by the inter-orbital width in this case and that all the requirements for a dermoid were fulfilled. The hair found in the cyst was similar to that of the lip rather than of the nose. In foetal life there is a median groove and the single frontal process must be thought of as in two halves becoming fused.

March 15

Aims and Activities of the Johns Hopkins Otological Research Laboratory. By Dr. Samuel J. Crowe.

Briefly, the work in our laboratory is divided into several parts but our principal aim is the correlation of normal and pathological hearing. It is important to limit ourselves to only a few

deaf people and, since in the Johns Hopkins and City Hospitals there are about 1,200 autopsies per year, every one is tested who might come to autopsy. To accomplish this, there is the necessary cooperation between the various staffs and, when the condition of the patient permits, hearing tests are done in a sound-proof room.

Since 1924, 10,000 audiometer records have been made and 1,500 temporal bones sectioned serially. Hearing and acuity records were made on 7,000 patients. Correlations with pathological conditions were made: (1) To determine the loss of high tone perception (Dr. Polvogt will give what we may expect from such study); (2) in connection with lesions of the middle ear. In this, the work of Weaver and Bray was a godsend to us. We have accumulated a large number of temporal bones associated with various degrees of impaired hearing.

Due to the development of the audiometer, we have been able to make quantitative estimations and test high as well as low frequencies. With the tuning fork, the high limit is one third off and, with the monocord and Galton whistle, you can not determine the degree of impairment.

Only in recent years were we fortunate in getting the services of Dr. Guile of Michigan University and even after he came it required four years to get a good enough method to section the hair cells. After that we began to correlate the findings in some of the most common types of deafness.

THE ANATOMICAL BASIS FOR THE IMPAIRMENT OR LOSS OF HIGH TONE PERCEPTION. By Dr. LeRoy M. Polvogt.

For three years we have been correlating hearing test records and histologic specimens of middle and inner ears from patients with impaired high tone perception. Several hundred temporal bones were examined by serial section and from this group only sixty cases were found which had been tested under more or less ideal conditions and were suitable for study. These conditions were: (1) That the patient was alert and willing to cooperate; (2) testing was done in a sound proof room; (3) the time between testing and receiving the temporal bones was not more than a few months; (4) temporal bones were put in suitable fixing fluid shortly after death; and (5) fixation and histologic sections were good enough to judge about the condition of the

finer nerve fibres and end-organ structures. Sixty-four specimens showed normal middle ears and thirty-five gave evidence of old otitis media without any direct bearing on impairment of high tone perception. The remainder were not considered for technical reasons.

In addition to hearing tests, a complete history, physical examination, clinical laboratory tests and autopsy records were made on every case. From these observations, the high tone loss is shown not to be due to any one systemic disorder. In fact, we have no idea of the etiologic factor, unless it be a focal infection.

Early in our study, it became evident that the important pathology affecting high tone perception is in the basal coil of the cochlea and chiefly its lower half. In most cases one finds damage to the end-organ or nerve. This end-organ of Corti, attached to the basilar membrane in the cochlear duct, is surrounded by endolymph, which is secreted by the stria vascularis, the sole source of its nutrition. Extreme atrophy of the stria must therefore change the endolymph and the nutrition to the organ of Corti, decreasing thereby the irritability of the hair cells and the acuity for high tones. The changes we find vary from atrophy of the hair cells alone to complete atrophy of the entire end-organ and nerve in the bony spiral lamina. These changes portrayed in the charts and microscopic sections indicate some anatomical basis for the loss of high tones. When one groups a number of cases with loss above a certain octave and having similar pathology, one is justified in thinking of certain areas of the cochlea as associated with perception for definite tones.

Experimental Studies of the Physiology of the Ear. By Dr. Walter Hughson.

During the past two years, investigations were made on the cat's ear to determine the normal physiology and function of its individual parts. This was made possible by using the change in electric potential in the auditory nerve and stimulating with tones of different frequencies produced by an oscillator, heterodyne audiometer or phonograph. Electrodes were placed on both auditory nerves through trephine openings and, by turning a switch, the lead could be brought from either right or left nerve.

The effect on mobilizing the round window membrane has been reported; so during the year an effort was made to determine

what type of experimental lesion might be benefited by its immobilization. Cases with slight deafness following middle ear infection showed many adhesions in the attic and a mass of adhesions in the round window niche. Cases with marked deafness following infection showed the pathology confined to the attic while the round window was unaffected. When a pledget of cotton was placed in the round window niche of a cat's ear, before and after ointment was injected into the middle ear to represent pus, it was found that intensity of sound was reduced far less with the pledget in than with it out.

In experiments on the stapedius tendon, as in those reported on the tensor tympani muscle, no effect was produced except by extreme tension. These two muscles, therefore, seem to function in some protective manner and to immobilize the ossicular chain almost completely; as against loud noises. Tone islands and loss of perception for larger areas of tone frequencies were experimentally produced by drilling holes part way through the bony cochlea in various places and burning restricted areas of cochlear structure. By testing these animals with the heterodyne audiometer graduations in tenths of octaves were possible and the charts demonstrated complete loss of certain tones with return at other frequencies. Histologic sections also showed very definite types of lesions.

April 19

Meeting in New York with the Section on Otolaryngology of the New York Academy of Medicine.

May 17

Motion Picture Demonstration

Dr. A. M. Ornsteen and Dr. Edward E. Sprenkel (by invitation): Tic of the Auricle Muscles.

Dr. Samuel R. Skillern, Jr.: A Motion Picture Demonstration of the Living Cilia of the Nose.

Dr. Henry Dintenfass: Facial Paralysis a Beginning Mastoid Symptom. Operation and Recovery.

Dr. Louis H. Clerf: The Diagnosis and Treatment of Pharyngeal Diverticulum by the Combined One-Stage Method.

PROCEEDINGS OF THE SECTION ON GENERAL MEDICINE, JANUARY TO MAY, 1933

January 23

Clinical Observations on 191 Ward Patients. By Maurice S. Jacobs, M.D., and Joseph C. Doane, M.D.

The presentation was made by means of a number of charts which summarized the important findings and conclusions to be drawn from the study of these cases. Chart 1 depicted the sex distribution, the average length of hospitalization, the condition on discharge, and the mortality and autopsy rates, the latter having been 68.2 per cent. Chart 2 compared the Diagnosis on Admission with the Final Diagnosis, and showed partial or total agreement in 60 per cent of the cases, and total disagreement in 25 per cent. Chart 3 compared our Final Clinical Diagnosis with the findings proven either by operation or autopsy. This showed partial or complete agreement in 90 per cent. Chart 4 listed the number of cases by disease groups, e.g., cardiovascular, respiratory, etc.

The remaining three charts outlined the diseases in the various systems as far as possible etiologically. This was done especially in the heart cases, following the criteria of the American Heart Association.

Following the presentation of the charts, certain important points were stressed, e.g., the high incidence of the cardiovascular diseases, to the extent of one third the total number of cases.

A more detailed analysis of the twenty-two deaths was given, and an attempt made to point out errors in diagnosis or treatment which might have influenced the ultimate outcome of the case. Certain unusual cases were narrated in further detail: that of a young girl who succumbed at thirteen to a doubly infected blood stream; the case of a 23-year-old woman admitted with a diagnosis of hysteria who proved to have a post-abortal septicemia, septic endometritis with endocarditis and meningitis.

In conclusion the value of such a study to the general hospital was stressed, especially as it fosters more complete study of cases and self-analysis. The importance of correlation of ante-

mortem and post-mortem or operative findings was also emphasized.

TONSILLECTOMY IN ITS RELATION TO THE PREVENTION OF REACTIVATION OF RHEUMATIC FEVER. By W. Grady Mitchell, M.D., and William D. Stroud, M.D. (*From the cardiac clinics of the Pennsylvania Hospital and the Robinette Foundation of the University of Pennsylvania.*)

The havoc caused by upper respiratory infections, including tonsillitis and pharyngitis, in patients suffering with latent or subacute rheumatic fever, is well recognized. These infections are often accompanied by such severe pancarditis that death occurs within a few days or a few weeks. In those who recover, further damage to the heart usually results with loss in cardiovascular reserve, and probable shortening of the patient's life.

For many years, one of the most universal methods of treating children with rheumatic fever has been tonsillectomy. For ten years we have insisted upon tonsillectomy before admission to the Children's Heart Hospital of Philadelphia, where practically all the patients have rheumatic cardiovascular disease.

Kaiser [1] concludes from a study of 2,200 tonsillectomized children and the same number of controls, that, "first attacks of rheumatic manifestations occur from 30 to 50 per cent less often in tonsillectomized children. The greatest reduction occurs in children tonsillectomized early. Recurrent attacks are not benefited at all."

In studying two hundred cases of rheumatic heart disease, one hundred tonsillectomized and one hundred non-tonsillectomized, the number of reactivations may be summarized as follows:

TABLE 1

	Ages	Cases Showing Reactivations		Period of Observation Following 1st Attack of Rheumatic Fever
	Years	*No.*	*Per Cent*	*Years*
100 Tonsillectomized Rheumatic Cases	5 to 25	42	42	5 to 10
100 Controls. Non-tonsillectomized Rheumatic Cases	5 to 25	40	40	5 to 10

[1] Kaiser, A. D., "Results of Tonsillectomy: Comparative Study of 2,200 Tonsillectomized Children with Equal Number of Controls 3 and 10 years after Operation," *Jour. A. M. A.*, 95: 837–842, Sept. 20, 1930.

If, however, we select a group of patients between the ages of five and fifteen, whose history is known for five years or more following the first attack of polyarthritis or chorea, and in the tonsillectomized group prove by careful nose and throat examination that the tonsillectomy has been successful, we find a different story. These observations are summarized in the following table.

TABLE 2

	Ages	Cases Showing Reactivations		Period of Observation Following 1st Attack of Rheumatic Fever
	Years	*No.*	*Per Cent*	*Years*
31 Tonsillectomized Rheumatic Cases	5 to 15	12	38	5
31 Controls. Non-tonsillectomized Rheumatic Cases	5 to 15	25	76	5

Our only justifiable conclusion is that in this small group, successful tonsillectomy has up to the age of 15 lessened the number of rheumatic fever reactivations, as compared with the control group.

Skin Hypersensitiveness to Nickel and Cobalt. By Sloan G. Stewart.

February 27

An Interpretation of the Normal Gastric Analysis. By Samuel L. Immerman, M.D. (*From the Stomach Clinic of the Jefferson Hospital.*)

The acidity values which are obtained in a gastric analysis are dependent upon (*a*) age, (*b*) sex, (*c*) individual idiosyncrasy, (*d*) type of test meal, and (*e*) manner of extraction of the meal. In addition to the fact that age and sex have usually been neglected in interpretation of gastric analysis, we have the still greater error of the failure to find reliable averages by statistical methods. In addition, there are special applications of statistical methods for finding reliable averages—cumulation of the means and finding the mean deviation of the mean deviations (Scott, E. L., *J. Biol. Chem.*, 73: 81, 1927). This latter method has never

been applied to gastric analysis. Predictions may be made from reliable averages (Dunn, *Physiol. Rev.*, 9: 275, 1929).

The following are important normals found in the literature: (1) 247 young men, oatmeal gruel, fractional extraction (Bennett and Ryle, *Guy's Hosp. R.*, 71: 286, 1921; Baird, Campbell and Hern, *Guy's Hosp. R.*, 74: 339, 1924; Apperly and Semmens, *Med. J. Australia*, 15: 237, 1928). These 247 subjects, comprising three sub-groups, show true differences among themselves, as estimated by the chi square methods. (2) 4,000 cases, all ages, arrowroot cookies and water, single extraction at one hour (Vanzant et al., *Arch. Int. Med.*, 49: 345, 1932). (3) There are a number of histamine normals, the largest being 988 cases of Polland (*Arch. Int. Med.*, 51: 903, 1933). (4) The fractional extraction of a bread and water meal is frequently used. While there is a large literature on the subject, there are few normals reported in such a manner that proper statistical use can be made of them. Kopeloff reported 10 pupil nurses (*State Hosp. Quar.*, 7: 326, 1921–2), and Wheelon reported 20 young men (*Arch. Int. Med.*, 28 (2): 613, 1921). These are the only reliable reports, statistically speaking, I have been able to find.

We are forced to the reluctant conclusions: (1) That we do not know the normal values of gastric acidity for the fractional bread and water meal, and (2) that in general, acidity values in a gastric analysis should be interpreted with a great deal of caution in a given individual.

THE HEART IN COMBINED SYPHILITIC AND RHEUMATIC INFECTION. By James R. Lisa, M.D., and Gertrude Jackson Chandlee, M.D.

The authors present the clinical, laboratory and pathological study of the heart in 6 cases of combined syphilitic and rheumatic infection encountered in 1,031 autopsies of which 71 cases were syphilitic patients with clinical heart disease, excluding aneurysms.

The study of this series showed that the predominant lesion in the heart was rheumatic in nature and the valvular lesions, stenotic in type, except where an extremely active inflammatory lesion was present, in which case the valvular lesions were regurgitant.

The evidence of syphilis in all six cases was most pronounced in the commissural region and was frequently limited to it. Syphilis of the myocardium could not be proven. Associated disease of the intrinsic coronary arteries complicated one case.

The clinical course of these cases of combined infection was rapidly progressive and, usually, typically rheumatic in nature. One case was neither rheumatic nor syphilitic in character. It presented paroxysmal dyspnoea with coronary pain and the histology showed coronary sclerosis.

Dyspnoea was of the type with congestive failure except in the one case with coronary sclerosis.

The clinical study suggests that the character of the pain accompanying rheumatic heart disease is pain of the infectious type. In sclerosis of the intrinsic myocardial arteries, the pain is anginal in type. In syphilitic aortitis accompanied by active inflammatory disease of the aortic wall, the pain may be described as large vessel pain. Further study of the character of pain accompanying cardiac dysfunction may clarify this important field and be of help in the differential diagnosis in cardiac disease.

Hypertrophy of the heart was marked in all cases and was extreme in one case in which histology of the kidney revealed a benign nephrosclerosis.

Heart sounds in the rheumatic stenotic lesions tend to be rough and high pitched. In the aortic region, even when accompanied by regurgitation, the rough sounds seem evidence of stenosis. In syphilis of the aortic valve, the smooth rolled back edges and the widened commissures give a soft, low-pitched murmur followed by a low-pitched diastolic murumur in which the systolic phase is scarcely separated from the diastolic. Heart sounds may help in the differential diagnosis of rheumatic and syphilitic aortic disease.

Eye grounds and x-ray studies help in the differentiation between rheumatic and syphilitic disease.

The electrocardiogram is of most value in studying the clinical course of the disease and as a check on digitalis therapy. The two hearts with the most marked disease of the auricular muscle, showed the greatest susceptibility to the toxic action of digitalis given in therapeutic doses.

The combined active infection in cardiac disease carries a graver prognosis than either infection occurring separately.

Jacob Mendez DaCosta (1833–1900): As I Knew Him. By S. Solis-Cohen, M.D.

Collapse Therapy in Pulmonary Tuberculosis. By David A. Cooper, M.D.

Collapse therapy is the greatest contribution to pulmonary tuberculosis since the principle of rest was first advocated. The literature of collapse therapy is reviewed, stressing the importance of this method of treatment. Early reports showed that collapse therapy was used in from two to five per cent of cases and more recent reports show this method of treatment used in from fifty to seventy per cent of all cases. It should be clearly understood that collapse therapy in no way replaces or alters the generally accepted rest treatment, but is a mechanical aid to the involved lung, simply applying the principle of rest to the infected part. Statistics show that a large percentage of moderately advanced and far advanced cases of pulmonary tuberculosis fail to respond to rest. This has forced the development of other methods of treatment. Improved methods mainly in the field of roentgenology have made this possible. Collapse therapy includes many operative procedures for putting the lung at rest and closing cavities. The most important of these are artificial pneumothorax together with its adjunct intrapleural pneumolysis; the crushing or evulsions of the phrenic nerve to produce temporary or permanent paralysis of the diaphragm; thoracoplasty in which all or part of the ribs on one side are resected. The indications for collapse are reviewed, the outstanding indication being a progressive unilateral lesion. However, the contralateral lung may contain a small amount of healed or at least quiescent disease. A group of cases is presented which brings out indications for pneumothorax, unilateral and bilateral, phrenicectomy, and thoracoplasty, these cases showing the applications of the methods and the end results after treatment.

Variations in Bleeding Time and Platelet Count. By Leandro M. Tocantins, M.D., and Harold W. Jones, M.D.

The bleeding time is thought by many to be dependent on or related to the coagulation of the blood. Papers on this subject are listed in the Quarterly Cumulative Index Medicus under coagulation of the blood. Although prolongations of the coagu-

lation time may sometimes be accompanied by moderate prolongation of the bleeding time, the most marked variations in the latter are found when the coagulation time is normal or even shorter than normal.

The bleeding time is apt to show qualitative as well as quantitative variation. It varies mainly according to the site of the determination, the condition of the vessels, the platelet level of the blood, and the condition of the skin. In experimental animals the mucous membrane bleeding time ranges from 1 to 2 minutes, and shows some prolongation when the skin bleeding time is lengthened. The bleeding time should be referred to as the skin bleeding time in order not to risk the implication that it is an expression of the bleeding potentialities of the individual as a whole. Sudden changes in the platelet level of the blood may explain failures in correlating the skin bleeding time and the platelet count. Multiple determinations, simultaneously and at different intervals, should be made for the proper evaluation of this sign. A single normal skin bleeding time in the presence of active hemorrhagic disease has no significance. Abnormalities in the skin bleeding time are the result of changes in the vessels, platelets, and skin in varying degree.

March 27

Fuso-Spirochetal Disease of the Lungs. By William P. Belk, M.D.

The work of Pilot and Davis, Kline and Berger, Smith and of Aschul, Herman and Pons and others furnishes strong proof that Vincent's organisms are primarily productive of lung pathology.

Anatomically the lesions produced are bronchitis, acute or chronic, putrid or bloody; bronchiectasis; atypical pneumonia; abscess; gangrene; and a chronic infiltrating inflammation closely resembling a form of tuberculosis.

The symptoms are the familiar ones of these several anatomical lesions, except that the patient may feel surprisingly well in some cases. Fever is variable, as is the white blood cell count. The x-ray gives the anatomical, not the bacteriological diagnosis. The question is wholly one of accepting Vincent's organisms as the etiological agent in certain of these familiar lesions and the consequent application of specific treatment.

Failure to demonstrate spirochetes in sputum more frequently is due to omission of simple but essential details: (1) The use of fresh sputum, not over thirty minutes old; (2) the selection from the specimen of sand-like granules for staining; (3) the use of a good stain, preferably Sterling's gentian violet, and (4) the examination of several specimens before making a final negative diagnosis.

Treatment consists of the intravenous injections of neoarsphenamine, three to ten doses at four-day intervals, or the subcutaneous injection of emetin hydrochloride, 0.04 grams daily, for ten to twelve days. Acute cases respond better than chronic ones because of the destruction of tissue in the latter.

My material consists of ten cases, two of acute fetid bronchitis, three of chronic bronchitis, one abscess, one lobar pneumonia, one bronchial pneumonia, and two of chronic diffuse infiltration. Of these, three were cured, three improved, and four unimproved.

My experience convinces me that Vincent's organisms may be demonstrated as the primary cause of a definite percentage of acute and chronic pulmonary lesions, and that a considerable proportion of these may be cured or benefited with medical treatment.

Studies on Peptone. By Carl Bucher, M.D.

Further Observations on the Use of Chest Leads in the Electrocardiographic Study of Coronary Occlusion. By Charles C. Wolferth, M.D., Samuel Bellet, M.D., Thomas M. McMillan, M.D., and Francis Clark Wood, M.D.

Fifty-seven cases of acute coronary occlusion and 280 controls, both normal and pathological, were studied with chest leads and limb leads. The following facts developed:—

1. Twenty-three of our fifty-seven cases of acute coronary occlusion showed signs of recent cardiac infarction in an anteroposterior chest lead (Lead IV) and not in limb leads, at some time during their course.

2. Three types of left ventricular infarction have been seen at necropsy: the anterior (5 cases), the posterior (1 case) and the lateral (1 case). Lead IV helps to differentiate these types electrocardiographically. In our series of 57, 33 were anterior, 18 were posterior, 5 were probably lateral, and 1 was not classified.

3. Huge upright T-waves in Lead IV probably signify acute or sub-acute anterior infarction.

4. The advantage of Lead IV over limb leads is seen mainly in the study of cases of anterior infarction. Twenty-one of thirty-three acute anterior cases, at some time during their course, showed diagnostic findings in Lead IV and not in limb leads. Moreover, Lead IV sometimes helps to differentiate T-1 inversions produced by healed anterior infarction from those due to other causes.

5. In our cases the pain of anterior infarction has usually been situated lower in the chest than the pain of posterior infarction.

6. Anterior infarction seems to have a less favorable prognosis for life and for adequate recovery than posterior infarction.

7. A standard normal electrocardiogram in the anteroposterior chest lead is as readily obtainable as a standard in limb leads.

8. S–T interval deviations caused by conditions other than acute coronary occlusion are, if anything, less confusing when chest leads are used with limb leads. They rarely resemble the typical electrocardiographic picture of either of the two common types of coronary occlusion.

Observations on the Action of Pepsin on the Gastric Musculature. By Martin E. Rehfuss, M.D.

April 24

Diabetes Mellitus Complicated by Acute Pan-Sinusitis, Bone Necrosis and Unilateral Cranial Nerve Palsies: Report of a Case with Necropsy. By Mitchell Bernstein, M.D., and Fred J. Kalteyer, M.D.

Unilateral cranial nerve paralysis, without other neurological findings, is a rare complication of diabetes mellitus.

The case reported was that of R. V., female, aged 34, a diabetic with chronic sinusitis who developed an acute upper respiratory infection, followed by coma. Subsequently, there was extension of the sinusitis with necrosis of the nasal septum and the hard palate. Paralysis of the third, fourth, fifth, sixth, seventh, and eighth cranial nerves, on the left side, occurred, in addition to occlusion of the left central retinal artery.

The physical findings otherwise were negative. The serology in blood and spinal fluid was negative.

It was difficult to control the diabetes. Necrotic nasal tissue was removed, followed by a terminal meningitis.

Post-mortem examination showed necrosis of the bones at the base of the skull, over the ethmoid and the left side of the sphenoid and the entire anterior surface of the left petrous portion of the temporal bone. The ethmoid and sphenoid sinuses were filled with thick, purulent material. There was a small area of necrosis in the orbital plate of the frontal bone on the left side. The posterior portion of the left orbit contained pus.

The clinical and anatomical findings in the reported case were characterized by: (1) An acute upper respiratory infection in an individual suffering from severe diabetes; (2) acute sinusitis superimposed on a chronic sinus disorder; (3) subsequent suppurative ethmoiditis with extension to the sphenoid sinus, necrosis of bone, and secondary inflammatory process along the left side of the floor of the skull.

This pathology explained the unilateral involvement of the third, fourth, fifth, sixth, seventh and eighth cranial nerves, and the occlusion of the left central retinal artery.

The difficulty of controlling diabetes in the course of a suppurative process was further emphasized.

Unstable Colon. By Franklin A. Weigand, M.D.

Aversion to the consideration of factors other than demonstrable structural changes decreases with the clinician's approach to maturity. "Nervous conditions due to increased irritability are more often found in the domain of the intestinal tract than in any other organ," wrote Eppinger and Hess over 20 years ago. Before and since that time the thoughtful physician has been impressed with the essential truth of this observation. Kantor has suggested "unstable colon" as a term more suitable for conditions described as "spastic colitis," "intestinal neurosis," "nervous diarrhea," etc. Chief symptoms are abdominal discomfort (belly consciousness), gaseous distention, constipation or diarrhea, pain, anorexia and loss of weight. These symptoms suggest so much that one must consider every entity from anaphylaxis to neoplasm. Three cases presented are considered interesting from diagnostic and therapeutic standpoints.

Case 1. A clergyman, 27 years old, complained of diarrhea of one year's duration, occurring every Saturday night; he had

lost 10 pounds in weight. His present and past history revealed his tendency to assume multiple responsibilities beyond his capacity.

Case 2. A young printer, 28 years old, complained of diarrhea of 2 months' duration. Chorea, several nervous breakdowns and a highly emotional background characterize his history.

Case 3. A white, unmarried female, 60 years old, complained of diarrhea of 2 months' duration. Her history revealed a lifelong tendency to "nervousness."

These cases represent types seen daily by physicians. Success in their management depends upon thorough, painstaking study, in particular the elimination of organic disease as a factor. Treatment includes general mental and physical hygiene, adequate, multiple vitamin diet, the use of calcium lactate or gluconate and sedatives when required. The most important measure is sympathetic guidance and interest on the part of the physician.

Acute Reticulo-Endotheliosis: Acute Aleukemic Monocytic Leukemia. By Russell S. Boles, M.D., Philip Custer, M.D., and Simon Propp, M.D.

The case of a young Italian girl thirteen years of age, who was admitted to the Philadelphia General Hospital with a history of acute otitis media and swollen glands supposedly due to "mumps," is reported. Examination revealed a moderate enlargement of practically all the superficial glands and of the liver and spleen. During the course of her illness hemorrhagic spots on the lips appeared, with bleeding from the gums. Hemorrhages in the retinae of both eyes occurred. She ran a relapsing fever suggestive of the Pel-Ebstein fever. The blood studies showed a progressive, severe, secondary anemia and a diminution of the blood platelets and throughout the illness a marked reduction, with occasional absence, of the granulocytic series of white cells. The icterus index was 6, van den Bergh negative, and blood chemistry negative. The patient gradually declined in weight and strength and in spite of repeated blood transfusions of citrated and non-specifically immunized blood, of ultra violet, x-ray, and nucleotide therapy, died after an illness of four and one-half months.

The blood studies indicated a destructive lesion of the bone marrow as shown by the anemia, leukopenia, and reduced platelets.

Biopsy of the sternal bone marrow and of a lymph node disclosed extensive reticulo-endothelial hyperplasia. Postmortem examination showed a generalized proliferating process of the reticulo-endothelial system.

The differential diagnosis of the case is discussed and its resemblance to Hodgkin's disease pointed out. Vincent's organisms were accidentally found in the vagina but were thought to have no etiologic significance in the case. The difficulty of basing a diagnosis on the study of the peripheral blood in such cases is emphasized.

Mercuric Chlorid Poisoning. By Reynold S. Griffith, M.D.

Forty-seven cases of mercuric chlorid poisoning were admitted to the Jefferson Hospital during the past twelve years. All of these showed definite evidence of organic injury from the poison. Seventeen cases resulted fatally and thirty recovered. The length of time before treatment was the most important factor in determining the outcome. Twenty-one of the non-fatal cases received treatment within thirty minutes after taking the poison; whereas, only four of the seventeen fatal cases received such prompt attention.

Due to the administration of the antidote and prompt evacuation of the stomach contents, the manifestations of organic injury were comparatively mild in the non-fatal cases. All had a rather severe gastritis and six had gastro-enteritis. Blood non-protein nitrogen values were above 40 mg. per cent, in only five cases.

The average duration of life in the fatal cases was eight days. The doses in this group ranged from 15 to 175 grains. All developed anuria on the first, second or third day. After variable periods of anuria, five cases reestablished some kidney function. In one case, treated by the Lambert and Patterson method, the output of urine rose to 3,000 cc. per day, but the blood non-protein nitrogen was uninfluenced and continued to rise; death occurred on the ninth day.

Three cases were poisoned by the introduction of corrosive sublimate tablets or solution into the vagina in attempts to induce abortion. All of these developed most severe gastro-enteritis, stomatitis and anuria.

Bilateral decapsulation of the kidneys was performed in six cases, after periods of anuria of from twelve hours to four days.

Two cases reestablished some renal function. All died on the fourth or fifth day after operation.

In no case, after anuria developed, could recovery be attributed to any of the popular forms of treatment. In one instance, the early administration of fluids—3,500 to 4,000 cc. per day, in the form of saline and glucose solutions—resulted in the reestablishment of renal function, a rapid reduction of the blood non-protein nitrogen and complete recovery.

May 22

Salmonella Suipestifer Bacteraemia with Acute Endocarditis. By Benjamin A. Gouley, M.D., and S. Leon Israel, M.D.

The *Salmonella suipestifer* has become identified since the World War with specific disease processes, notably gastro-enteritides and bacteraemia. The latter in certain aspects resembles typhoid and paratyphoid fever, and it is only within the last few years that a clear distinction from paratyphoid-B infection has been made. This has been accomplished mainly by the discovery of and standardization of specific carbohydrate fermentation reactions. A total of 34 cases of *Salmonella suipestifer* bacteraemia has been recorded and to this we wish to add another case which, in addition to having a characteristic clinical picture presented an acute mitral and aortic endocarditis which developed during the height of the infection. There had been no evidence of previous endocarditis. The murmurs, especially the mitral, were of almost explosive development, appearing suddenly and having a harsh blowing quality. The fever, which was maintained at a high level (104 to 105°), declined by rather sharp lysis and, in the four months that have passed since convalescence was established, there has been no recurrence of fever, although the mitral murmur has persisted. As endocarditis in typhoid and the allied enteric fevers is rare and, since this is the first case of suipestifer bacteraemia to be reported with such a complication, it became necessary to rule out with the greatest care a protean form of rheumatic fever. The bacteriological findings were corroborated by Dr. George W. McCoy, of the National Institute of Health, Washington, D. C., and Dr. Carl TenBroeck of the Rockefeller Institute, Princeton, N. J. The clinical course suggesting at first a primary peritonitis, the splenic enlargement, the absence of leucocytosis,

the afebrile post-infectious course and the excellent state of health at present enjoyed by this child make rheumatic fever appear unlikely. It is pointed out that the bacteraemia has much better prognosis in children than in adults in whom the mortality rate is 57 per cent (12 deaths in 21 affected adults), while in children the mortality ratio is judged to be about 7 per cent.

THE HEREDITARY FACTOR IN DIABETES MELLITUS. By Edward L. Bortz, M.D.

Heredity is responsible for about 25 per cent of all cases of diabetes mellitus and it is possible that the disease, or a morbid predisposition, in some cases has been transmitted through many generations in accordance with Mendel's theory of dominant and recessive traits.

An instance of hereditary diabetes is reported from the Lankenau Clinic in which ten cases have occurred within three generations. In this family there can be noted various influences which are known to have a relation to diabetes or to a lowered carbohydrate tolerance, namely, obesity, bacterial infections and cancer.

The carbohydrate metabolism can be disturbed from three different angles: glycogenesis, glycolysis and glycogenolysis. Promoting glycogenesis is the chief function of insulin, which appears to be little concerned with the processes of glycolysis, this being due to the oxidizing ferments, and glycogenolysis, which is controlled by the nervous-endocrine mechanism.

Hyperglycemia may be of any of the three types which should be differentiated before attempting to determine the hereditary factor. In the case of a chemical or metabolic abnormality, it is not unlikely that transmission of the defect is through the cytoplasm, but with a functional aberration, transmission is more probably through the genetic factors.

MUSHROOM POISONING. By Joseph B. VanderVeer, M.D., and David L. Farley, M.D.

Fatalities from the eating of poisonous mushrooms were recorded as early as the fifth century B.C. In America the first cases were reported in 1871.

There are two types of mushrooms which account for nearly all of the severe cases of poisoning. These are the *Amanita phalloides* and the *Amanita muscaria*. The former is the cause

of over 90 per cent of the deaths. These two types are very common in this country, growing from early June till the first frosts. The flavor is said to be delicious. The symptoms with the *Amanita muscaria* group come on within one to three hours and are salivation, perspiration and lacrimation with pinpoint pupils. Vomiting and purgation occur. Atropine is the physiological antidote and should be given in full doses.

In poisoning with the *Amanita phalloides* group the symptoms do not appear for from six to fifteen hours. Severe abdominal pain with nausea, vomiting and marked diarrhoea occurs. Jaundice usually appears on the second to third day. Death occurs with increasing coma, usually in about one week.

Four cases of *Amanita phalloides* poisoning are reported with two deaths. Post-mortem examination revealed severe toxic damage to the parenchymal organs especially the liver and brain. The gastro-intestinal tracts showed little or no damage.

Recently the use of raw, chopped up, whole rabbits stomach has been advocated in treating these cases. Its efficacy can only be determined by further investigation and clinical work, but it would seem that a means of lowering the high mortality in *Amanita phalloides* poisoning may have been found.

A Clinical Survey of Rheumatic Heart Disease in 1130 College Freshmen: Preliminary Report. By Stanley Harris, MD., and Wm. G. Leaman, Jr., M.D.

PROCEEDINGS OF THE SECTION ON MEDICAL HISTORY, JANUARY TO APRIL, 1933

January 9

Edgar Singer, Ph.D.: "John Locke: in Commemoration of his Tricentenary."

Donald A. Cadzow, Dept. Public Instruction, Harrisburg, Pa. (by invitation): "Archaeological Work Along the Susquehanna" (illustrated by motion pictures).

Dr. Harlow Brooks, New York City (by invitation): "Amateur Archaeology of the American Indian" (illustrated by lantern slides and motion pictures).

February 13

Dr. Walter R. Steiner, Hartford, Conn. (by invitation): "Dr. Wm. Beaumont; a Sketch."

Dr. Julius Friedenwald, Baltimore, Md. (by invitation): "Beaumont's Work as Related to Gastro-enterology."

Dr. I. S. Ravdin: "Beaumont's Work as Related to Surgery."

Dr. J. Monroe Thorington: "Albert Smith, Humorous Writer of London Who Began as a Physician."

March 13

Dr. Victor Robinson, New York City (by invitation): "In Quest of Aesculapius" (with lantern slides of original photographs).

Dr. James McCahey: "History of Gonorrhoeal Arthritis."

Dr. Burgess Gordon: "Grecian Athletic Training in the Third Century."

April 10

B. Roland Lewis, Ph.D., of the Folger Shakespearean Library, Washington, D. C. (by invitation): "John Hall, Phisicion, Son-in-law to Shakespeare.

Dr. Robert L. Pitfield: "Dr. Thos. Holley Chivers, of Georgia, the Wild Mazeppa of Literature."

May 23

Isaac Husik, Ph.D. (by invitation): "Baruch Spinoza: in Commemoration of his Tricentenary."

Dr. Horace James Williams: "The History of Ear Surgery."

Dr. Wm. G. Leaman, Jr. (by invitation): "The History of the Electrocardiograph."

PROCEEDINGS OF THE SECTION ON PUBLIC HEALTH AND INDUSTRIAL MEDICINE

March 31, 1933

A Modern Plan for a Community Campaign Against Air Pollution. By H. B. Meller, *Head, Air Pollution Investigation, Mellon Institute of Industrial Research, Pittsburgh, Pa.*

Pure air is primarily a medical consideration. Logically, its maintenance is a responsibility of the municipal health department, just as are pure food and pure water.

In view of the inadequacy of existing legislation, and also because definite action now may bring unusually desirable economic benefits, the time seems ripe for the medical profession to reassert its leadership and to make hygienically pure air an accomplished fact. Air hygiene is a part of preventive medicine; the initiative and guidance of physicians are necessary to the success of the cause of air hygiene.

The engineer has been concerned in smoke abatement with a view to fuel economy and because of the effects of the products of combustion on construction materials. The economist has been interested from the viewpoint of waste, added expense in cleaning, loss of natural daylight, and such phases of the problem. But, after all is said and done, the most influential factor in the effects of air pollutants is health.

The role of the physician is fundamental; he is looked to by the public to point out health hazards and to work for their elimination; and he is equipped to set the standard for atmospheric cleanliness—a standard which the engineer will then arrange to meet. The public commitment of the physicians in a community to a campaign for pure air will have as much force as the combined arguments of all other protagonists.

The plan suggested involves the organization of an Air Hygiene Commission, representative of all the community interests, under the leadership of the medical profession; a comprehensive survey to determine the amounts, sources and effects of air pollution; a study of available fuels and fuel-burning equipment; formulation of standards and recommendation of appropriate legislation.

THE MEDICAL SCHOOL AT PADUA AND THE RENAISSANCE OF MEDICINE

The Nathan Lewis Hatfield Lecture, XII *

By DR. ARTURO CASTIGLIONI

(*Professor of the History of Medicine, University of Padua*)

Among the first universities which arose in Italy at the beginning of the XIII century, and slowly organized on the lines of the ancient Latin schools of the Empire, taking certainly as model concerning Medicine that Salernitan school, which was the first lay medical school of which we know the organization, Padua is perhaps that which most surely and rapidly affirms a spirit of independence which sometimes assumes the character of a revolutionary tendency. The intellectual tendency of the University has a well defined characteristic note: the little university was formed at its beginning by a group of students when the Princes of Carrara dominated the town. In the year 1222 a few students of Bologna abandon the school of law of this town which seems to have been already well organized and migrate to Padua bringing with them some of their teachers, as had happened some years before when a group of students had chosen the town of Vicenza as their seat of learning. In that time and still more in the following century the University was much more bound to the scholars and to the teachers than to the city: Universitas meant exactly a community of students who chose their masters and then formed an independent organization. These men who considered study as the principal aim of their lives let themselves be easily induced to change their residence going where the conditions of life were more favorable, the protection of the Commune and of the Princes more efficacious, the safety of life greater and the kindness of the citizen more cordial; in many cases the students were attracted and enticed from the one or the other town with promises of particular privileges, of exemption from the taxes, of excellent teachers. Thus in

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1228 Vercelli, which was a little town in Piedmont, sent to Padua its representatives to invite the students with the largest promises to come there. From the document witnessing this fact which is still preserved one can see that in the year 1228 four groups of students already existed, divided according to their nationality: the first of Latins of the langue d'oil (that is to say French and Normans), the other of Latins of langue d'oc (Provencals, Spaniards and Catalans), one of Germans and one of Italians. In this time the students must have been a great number, because the town of Vercelli promised to find for them 500 lodgings and more if it should be necessary.

During the whole XIII century the prosperity of the University of Padua increases in spite of the menaces of the Emperors and of the Popes who are often in conflict with the town: the corporations of students are sometimes only two: Transalpini or Ultramontani and Cisalpini or Citramontani.

This division according to the Nationality is for some centuries the only recognized and perfectly ordered: not until the beginning of the XIV century the universitas artistarum, medicinae, physicae et naturae is constituted as a faculty which collects all students of natural sciences and of medicine; and rights equal to those of the universitas juristarum, the faculty of law, are granted. But the medical teaching was organized already from 1250 in which time two chairs of medicine were established. In 1262 the chairs of medicine are three and the tendency to entrust different professors with the teaching is more and more manifest. In early times the teachers were elected by the students, but it gave origin to such tumults that the elections began to be made by the State, and at the end of the XIV century professors are appointed only in this way. In the time in which, during the XIII century the Arabistic current became stronger in Italy, and in literature, in art, in science the effect is felt of the penetration into Italy, of the ideas which had arisen in the great centres of culture of Islam, and the western world receives from them through the Arabian commentators and the Jewish translators, unknown writings of Aristotle, Tolomeus and Galen, and the dawning of the Renaissance of the classical studies, which has later a stronger impulse, begins, when with the fall of Constantinople some eminent Greek scholars come to Venice and spread the study of the Greek language, Padua has already the

name of an Averroistic university, almost in opposition to Bologna which is essentially scholastic.

In Padua taught at the beginning of the XIII century Pietro d'Abano (1250–1316), a physician and philosopher who was one of the most eminent scholars of this time and with his vast literary and scientific lore dominated the whole learning of this epoch. He attempted to resolve with syllogisms the contradictions which arose between the medicine of the Arabic authors and speculative philosophy; he endeavoured to prepare a complete treatise of theoretical and practical medicine in which all tendencies should be reconciled and the scholars could be informed both concerning that natural philosophy which in the opinion of the author was the pivot of all sciences, and concerning the diseases and their remedies. An Averroist in his ideas, a dialectician in form he stated in his book "Conciliator controversiarum quae inter philosophos et medicos versantur," from which he had the name and the fame of a conciliator, all problems as dialectical queries and solved them so that almost always the empirical proofs are overcome by the syllogism. And yet through the farrago of these philosophical discussions the acute observation of a man of genius is apparent. His true master in medicine is Avicenna: in his studies on the soul Pietro is generally faithful to the ideas of Averroes, but sometimes he contends against Aristotle and Averroes at the same time; doubtless he shows himself a man who is able to detach himself from the classics and to discuss the authority of the greatest of them.

Pietro d'Abano was one of the first and strongest defenders of the Italic Averroism in which one must recognize the rebellion against the yoke of theologizing philosophy. Averroism collects some ideas and tendencies deriving from the great Arabian physicians and particularly and above all the thesis of the common intellective soul of the human species. One should not forget that Averroism means first Arabism, and then all those who had drunk at the Arabic sources and accepted the authority of the great Commentator of Aristotle.

The influence exercised by Pietro through his teaching and his books, some of which were considered till the end of the XIV century as very authoritative texts, was certainly deep and vast, and even Dante who lived at Padua in this time and probably was one of his pupils, felt his influence. The name of this phy-

sician and philosopher, who had gone to Constantinople in order to study Greek and to read Galen and Aristotle in the original texts, and the fame of this scholar, who had taught medicine in Paris and had been considered there as one of the greatest masters, were diffused through the whole of Italy. His fame moreover was perhaps increased by the news of the persecutions by the Dominican friars who had accused him of heresy because of forty-five propositions contained in his work which were considered contrary to Christian dogma. When he was called to the city of Padua, and became in the year 1306 professor of medicine at the University, his name was already well-known to all who dedicated their studies to philosophical researches. An eminent physician, he very soon became a celebrated practitioner and was consulted by Pope Honorius IV and the Marquis Azzo d'Este. The crowd of students who came to attend his lectures was so numerous that Gentile da Foligno, one of the great surgeons of this time, when he came before the hall where the master was teaching fell on his knees crying out: "Hail, holy temple!"

During the XIII century the studies of medicine flourished in all the universities of Italy and while in Bologna with the teaching of Mondino de'Luzzi the new travail of the anatomic thought was beginning, and the first surgeons, heirs of the Salernitan teaching, were taking their first steps towards the institution of the new surgery, Padua becomes at the end of the century the most important centre of epidemiologic studies. The pestilence, which about the middle of the XII century had devastated Italy, taught the necessity of defensive measures, particularly for the sea-towns which drew their wealth from the oversea trade; and Venice forbade already in the year 1374 entrance into the town to infected or simply suspected persons and goods. Ragusa published the first by-laws concerning quarantine; and very soon, at about the end of the century, Venice collected all the measures against pestilence in an exemplary sanitary legislation. To this end the contribution of the great masters of the Paduan university was very precious. Among these teachers Pietro da Tossignano, author of the renowned advice against pestilence, was one of the most famous; but the most authoritative was doubtless Gentile da Foligno, who had been called in 1337 by Count Ubertino di Carrara to teach medicine at the uni-

versity. He was called "the soul of Avicenna" and his advice had the greatest diffusion. Genoa, and the towns of Tuscany and of middle Italy took counsel with him in difficult cases.

In the XIII century there is an important development in the study of anatomy: Pope Sixtus IV gives officially the permission to dissect; and Alessandro Benedetti, a teacher of anatomy in Padua about the end of the century, published a treatise on anatomy in five books and 138 chapters, affirming the necessity of anatomical dissection independently of the custom, generally accepted till that time, of conceding to the school only the corpses of executed persons. To him we owe the construction of the anatomical theatre where he delivered his first lectures: to Antonio Benivieni, the merit of having been the first forerunner of Morgagni, with his important observations in the field of pathological anatomy, to which he brought an important contribution of exact observations.

At the end of the XIII century flourishes in Padua the study of botany, which became the foundation of all later researches in the field of natural sciences. Among the humanistic authors who held Pliny in great honour, two deserve to be particularly noted: Giorgio Valla, a Latinist of great worth, a deep scholar in classical literature, who conferred elegance upon scientific language, and Ermolao Barbaro, an eminent philosopher, who endeavoured to restore the text of Pliny and wrote a commentary on Dioscorides.

The life of this man, who can be considered as the prince of the humanists of this time, deserves really to be quoted: he was crowned poet laureate in his fourteenth year by Frederic III, took his degree in Padua in 1477; translated and published some books of Aristotle, held public office, taught the Greek language and literature, and had in his home reunions of the most celebrated scientists of his time. He was in 1486 ambassador of the Republic of Venice to the Emperor Frederick, and in 1489 ambassador to Pope Innocent VIII, who created him Patriarch of Aquileia and Cardinal. He died in 1493, not yet 40 years old, leaving some works which reveal an astonishing erudition and a perfect knowledge of the Greek language and literature and of the classic antiquity.

Thus we find about the end of the XIII century the first bud of the renaissance of medicine, which flourished contempo-

raneously with the renaissance of philosophy, of letters and of art, in the most brilliant period of Italian history, when the university, especially through secular work of patient researches opens its doors to the new doctrines which tend to deliver science from its bonds.

The return to the old texts, begun by the Italians who had never lost contact with the Greek spirit, ardently supported by the humanists, renders the relations of the western world with the Hellenism more intimate. While on one hand the return of the old Greek and Latin authors in their original form seems at the beginning to strengthen their authority and to make the criticism of them more difficult, on the other hand the Italians discover in the old texts those sane reasonings, keen observation, and freedom of inquiry and criticism, which for too long a time seemed to have been forgotten. One begins to understand in Italy that more than the maxims of the ancients, the spirit which dictated them is admirable: the Italian spirit comes little by little nearer to the thought of the ancient classics and to the form of their literature; and I believe that it is essentially from this humanism that free and fruitful criticism, objective and impartial is born, which grows with individuality in medicine and in art, with the desire to see new things and to think with one's own brain instead of accepting supinely the dogmatic affirmations of the school. In the spirit of humanism the foremost factor of the renaissance of medicine has to be sought; a renaissance which was in preparation during the last centuries of the middle ages with the studies of anatomy, with the first clinical observations, with that love of nature which is characteristic of the Renaissance.

At the end of the century another factor of great importance contributes to prepare the new times, that is the invention of printing. To this epoch belong the first printed and partly illustrated texts of medicine, and in order to imagine what a change the diffusion of printing brought also in the field of medical culture it suffices to remember that as late as in 1395 the University of Paris possessed only some few manuscript books of medicine.

The part which Venice and the Venetian printers had in the diffusion of medical culture is noteworthy. We must recall that in the last decade of the XV century two hundred Venetian printers published 1500 works, more than all the other printers in the whole of Italy. We must recall that to this epoch belong

the first anatomical figures, and that it is probable that the sight of the first drawings, in some old reproductions of the five or six figures which represented the osseous, arterial and venous systems and were derived from Arabian and Persian manuscripts, had demonstrated their inexactness and made it necessary to replace them little by little with figures based on the examination of the corpse. Certainly the first old anatomic figures of the old handwritten texts, so plain in the ingenuousness of their lines, showed more evidently their errors and demonstrated that correction was necessary: perhaps it was thanks to the old drawings that the initiative for anatomical teaching through the figure arose, to which another fact gave an extraordinary impulse: the renaissance of the Hellenistic conception according to which disease is only a disturbed harmony which it behooves Nature to cure.

In this time of the renaissance of the conception of life, Padua was the only school in which freedom of research and of teaching was granted. In Padua Andreas Vesalius, who had been educated at Louvain and studied medicine at Montpellier and Paris and taught anatomy in Louvain, became in 1537 professor of anatomy. In Padua where the university owing to the intelligent care of the magistrates of the Republic, was at this time in its greatest splendour, and where from every part of Europe scholars came as to the most renowned centre of learning, Vesalius found that possibility of free research, that comprehension of his work and of his courageous criticism which rendered it possible for him to accomplish a work which seemed in his time to be incredibly audacious. The chief task of his life was to renew the teaching of the anatomy of the human body and to overthrow the teaching of Galen, which during sixteen centuries had not only prevailed but been considered indisputable. He demonstrated that the studies of Galen were based only upon animal dissections, and that all that concerned the human body had been hardly observed. He taught from the same chair from which all teachers had bowed to the high authority of the great master of Pergamon, that he had made hundreds of errors, and that it was necessary to begin again the study of anatomy. It was certainly excessive daring for a young man of hardly 25 years, and the struggle was very sharp; but Vesalius knew how to carry it, perfectly sure of the truth of his ideas, animated only by the conviction of the absolute necessity of clearing the field from all ancient superstitions. He was also

in first place the great and courageous reformer of pictorial anatomic representation: in Padua some great artists, such as Mantegna, one of the first realistic painters of corpses, and Riccio, the exquisite sculptor who reproduced in his fine bronzes with perfect fidelity the forms and the muscles of men and animals, had certainly exercised their influence on the development of anatomical thought: Riccio was a great friend of the anatomist Marcantonio Della Torre and sculptured for this family of physicians in the Church of S. Fermo in Verona, a magnificent monument the bas-reliefs of which at present preserved in the Louvre, belong to the best works of Italian Renaissance. Vesalius understood clearly the importance of adorning his book with the best drawings: he supervised with the greatest care those who worked for his book and to whom he probably indicated himself, the object of the drawings. He complains in his letters of the trouble they had caused him, and found as collaborator one of the best pupils of Titian, Jan Stephan Kalkar, a Flemish painter whose paintings were often difficult to distinguish from those of his master. Probably Kalkar engraved the pictures on wood: certainly the figures are executed with perfect truthfulness and with great taste, chiefly from dissections of youthful bodies. The drawings are free and bold and in the book of Vesalius we find for the first time in a text for students a clear representation of true facts in the most beautiful form.

Thus under the protection of an intelligent and strong government which considered the university as one of the most important instruments of its political power, in this fertile ground, modern anatomy, as Leonardo had imagined it in his solitary work, was born. In a time in which in the German universities anatomical teaching was not yet regular and when in Flanders Vesalius himself was compelled to undertake some adventurous expeditions with his students to steal the corpses of executed persons and thus find the possibility of dissections, and when the great anatomist was persecuted at the Court of Spain by the enemies of his affirmations, Padua was the centre of experimental science. When Vesalius set out on a pilgrimage to Jerusalem and received a call from the Venetian Senate to reoccupy the chair of anatomy, his greatest longing was to come back to the town which to him seemed "the only nurse of high genius."

But not alone because Vesalius was one of her great teachers and because in Padua his immortal book was written and the anatomical figures designed, Padua deserves the first place in the history of the Scientific Renaissance in Italy. Before and after Vesalius Padua had among its professors some of the most excellent anatomists of all times. Here taught Gabrielle Falloppio who was certainly the most courageous of the innovators and the most illustrious of the Italian anatomists of this century. He departed even more decisively than Vesalius from the teaching of Galen. He corrected the descriptions by Vesalius of the orifices of the cerebral arteries and of the clitoris: he described the tubes that bear his name, the oculomotor muscles, the cerebral nerves, the chorda tympani, the semicircular canals and the aqueduct. The first edition of "Observationes Anatomicae" was published in Venice in 1651. His pupil was Gerolamo Fabrizio d'Acquapendente (1537–1619) who studied particularly the anatomy and physiology of the uterus and of the foetus. To him is due the creation of a new anatomical theatre at Padua, which is still preserved. He was the author of an important study on the physiology of respiration and of the voice, and it is curious that he treated once this subject so profoundly that it is told that one day, in 1588, all the students of German nationality deserted his school, thinking that in the explanation of the mechanism of the muscles of the tongue he mocked their pronunciation of Italian. He studied not less deeply the physiology of the circulation and was the discoverer of the valves of the veins. He was the teacher of Harvey and in the hall of the old Paduan university, where the coat-of-arms of the most illustrious students are painted, we find that of Guglielmo Harvey, belonging to the Natio Anglica: a burning candle between two snakes of Aesculapius. That was the time in which from the whole of Europe the strangers came to Padua to learn anatomy: a pupil of Falloppio was Volcher Voiter, born at Gröningen in 1534, died in 1600, whose works are important for the development of the anatomy of the human foetus and the child. A pupil of the Paduan school of anatomy was the Spaniard, Juan Valverde di Hamuzco, who published a manual of anatomy in Spanish which had a great diffusion. Of this anatomical school Haller could justly write: For a century and a half it was the leader of all Europe, so that there were but few dissectors who did not come from its halls.

The studies of physiology began in Italy with the Renaissance and many of them were devoted to the circulation of the blood, among which were those of Realdo Colombo, successor to Vesalius in the chair of anatomy at Padua, who in 1558 published a work in which he affirmed the non-existence of the passages through the septum of the heart between the right and left ventricle, belief in which up to that time had been generally accepted. He clearly stated that the arteria venosa (pulmonary vein) carried blood and not air and he indicated the greater circulation in a general way. He was the teacher of the greatest physiologist of this period, Andrea Cesalpino, a physician and a philosopher, born in Arezzo in 1519, who attacked one of the most important of the errors of the Galenic concept, namely, the inclusion of the liver in the greater circulation. He was the first to use the word "circulation" (1559) and observed what happened in the veins after a ligature had been placed about the arm. His discovery is the essential basis for the doctrine of the circulation of the blood which was later completed and clearly described by Harvey.

Thus the most important and decisive of the problems of physiology, whose solution marked the fall of the Galenic conception, found at the University of Padua its foremost workers: from Colombo to Cesalpino, from Fabrizio d'Acquapendente to Harvey. In a magnificent collaboration which had been hitherto without example the work of anatomy and physiology of scientists of different nations had prepared in Padua the triumph of exact sciences.

But clinical sciences very rapidly followed this movement. To this century belong the first studies of psychiatry of Giovanni Battista da Monte who devoted his attention to melancholy and other forms of nervous diseases while Girolamo Mercuriale, a great teacher also in the field of hygiene and of medical gymnastics, endeavoured to classify them according to the aetiology; in Padua begins the teaching of pharmacology which drew a great advantage from the institution of the so called garden of simples, of which the oldest was founded in Padua by Francesco Buonafede in 1545. The clinical teaching is initiated at the end of this century by Giovanni Battista Da Monte at the bedside of the patient. From this teaching in Padua the clinical teaching of the University of Leyden arose. Evald Schrevelius and Jan van Heurne who had been scholars at Padua, brought this method of

teaching to Holland where medicine throve in a free and very rich country which seemed to inherit in the XVII century the fortunes of the Venetian Republic and its part in the progress of science, just as it snatched from Venice, after the discovery of the new trade routes, the domination of the seas.

The most interesting figure of the Paduan Renaissance is surely that of Gerolamo Fracastoro, a man of genius who was in Padua a comrade of Nicolaus Copernicus, a pupil of the great anatomist Achillini and a friend of Cardinal Pietro Bembo, the great humanist. Pathological conceptions had a very important evolution during the Renaissance, due to the fact that in this epoch certain diseases spread through Italy which up to then had been but little known: smallpox, chickenpox, influenza and typhus. In the sixteenth century syphilis spread all through Italy in the form of an epidemic disease which claimed many victims.

This is not the place to take up the much discussed historical question as to the origin of syphilis; that is, whether it was brought to Europe through Spain after the discovery of America or had already existed in Europe in milder forms. It is certain that it was spread through Italy more extensively than through other European countries and was closely studied and efficiently treated. Hyeronimus Fracastoro was the most illustrious among the many physicians who dedicated their study to the pathology of syphilis. He wrote a poem, which was considered during the Renaissance as the most beautiful poetical work in Latin verse, worthy to be compared with the poems of the Golden Age of Latin literature. This poem entitled "Syphilis sive Morbus Gallicus," which was published in Verona in 1530 had an enormous and widespread publicity. The name of the disease is taken from this poem, in which Fracastoro told the story of a shepherd, called Syphilus, who contracted the terrible disease as a punishment from Apollo. He gives an exact description of the disease, prescribing the use of mercury and guaiac in its treatment.

The most important work of Fracastoro, although it is not to this book that he owes his greatest reputation, is the "De Contagione et Contagiosis Morbis," published in 1546 at Venice, which is by far the most valuable example of his scientific value. Fracastoro was the father of modern epidemiology and was the first to study epidemic diseases in the light of scientific concepts, distin-

guishing three forms of infection and contagion. These were contagion by direct contact, such as scabies, leprosy, etc.; contagion by indirect contact by means of fomites, such as clothing, sheets, etc., which are carriers of the germs of the contagion and thus spread the diseases; and finally a third form in which the disease could be transmitted at a distance without direct contact, such as plague, smallpox and similar diseases. In such cases he imagined that the germs were propagated by selecting the humors for which they have the greatest affinity, entering the organism by means of the respiration. The germs (seminaria) were then thought to be absorbed from the breath and adhered to those humors which carried them to the heart. These germs according to Fracastoro have the power of multiplying rapidly. Those that infected animals could not infect plants, and vice versa, and there were even certain diseases confined to man or to certain animals; certain diseases had even special affinities for certain individuals or organs. Hence it is apparent from these statements that Fracastoro had a clear insight into the specific characteristics of contagion and should be considered as one of the important precursors of the modern doctrine of infection.

Among the diseases which appeared for the first time in Italy or rather were first studied in this century was typhus fever. In a Parmese diary of 1477 there is described an epidemic with high fever and exanthems, which was probably typhoid fever; also the so-called Marranic plague which spread through Italy from 1492 to 1493, as can be learned from the writings of the Jews banished from Spain. The first clinical description of this disease we owe to Fracastoro who in his classic book on contagious diseases described it with accuracy, distinguishing it from bubonic plague and typhoid fever.

The pathology of tuberculosis was also studied by Fracastoro, who maintained the contagiousness of the disease and the possibility that it might also be spread by means of the clothing and bed linen. This concept guided Fracastoro in prescribing prophylactic measures in the fight against tuberculosis: he forbade the use of purges or of substances which hindered expectoration. In all his work it can be clearly seen how modern scientific epidemiology had its origin in the outstanding writings of Hieronymus Fracastoro.

Contemporarily Italian surgery made great progress in this

century, and also in this field Padua had some of the best known surgeons as teachers. Among these it will suffice to mention the names of Fabrizio d'Acquapendente, the anatomist, who enjoyed the fame of being the greatest Italian surgeon of his time, and Giovanni Antonio Della Croce who published in Venice in 1573 a book which had a widespread sale, and was considered the classical text on surgery for more than two centuries. The description of trepanning in cases of wounds of the skull forms an important chapter of this book in which all instruments which are necessary for these operations are reproduced.

This scientific movement of progress in all fields of medicine, of which I have endeavoured to give a picture in its most important expressions, found its climax when at the beginning of the XV century, Padua being ahead of the scientific progress, the gigantic figure of a man arose who impressed on the whole historic epoch the mark of his individuality. Galileus Galilei, discovering the telescope and the microscope gives two mighty weapons to research and is the founder of experimental science.

In the time in which a great passion for studies, a great love of beauty, and inexhaustible desire for glory vivified all the works of the Italians, Padua is the most important centre of scientific researches. Here come teachers and students from all parts of Europe, here the astronomers search the secret of the stars, the physicians the mystery of life, the mathematicians the most difficult problems of geometry and of algebra: from Copernicus to Galileus, from Vesalius to Fabrizio d'Acquapendente, from Colombo to Fracastoro, physicians, politicians, lawyers, physicists, naturalists and mathematicians prepare and accomplish the Renaissance of Science. In Padua the great international currents meet: the far seeing protection of a wise government preserves the freedom of teaching and of learning as a great treasure.

How important a part foreign students had in the life of the university and particularly in the school of medicine, is demonstrated by the books of the foreign nations in which their Consiliarii noted the most important happenings. Sometimes the representative of the students complains before the authorities because the lectures were not regularly delivered. In the year 1587 a few national groups were represented in the Natio Alemanna, that is the students from Switzerland, Bohemia, Denmark, Flanders and Poland, and each group chose its representative.

The Consiliarius of the Natio Alemanna had the right to hold the matricular book and he had the first place in all the ceremonies of the university, two votes in all meetings and the right to bear the sword. The English students were so numerous that in 1534 the Natio Anglica divided itself from the Scota: in 1603 the English, the Scotch and the Irish are again united in the English nation. This nation had its own councillor, a beadle and a secretary (cancellarius); it possessed also its own library and special privileges.

The influence of Padua on English medicine during the Renaissance is undoubtedly very important. I do not know whether it is really possible to limit the Italian influence on English scholarship to a definite period of time, that is from the beginning to the end of fifteenth century, as Lewis Einstein * thinks; surely throughout the whole Renaissance we find in English literature many quotations which demonstrate that at the Paduan school British scholars were very common. Many Oxford men crossed the Alps during the fifteenth century: Vicenza and Vercelli had English rectors: the new spirit of the Renaissance had effected a revolution in the intellectual world, and Oxonians went to Italy in search of the new Humanism. I may mention one of the most renowned of the English scholars of Italian Universities: John Tiptoft, Earl of Worcester, who was known in the whole of Italy for his scholarship and was considered, as Einstein says, the first example of an "Italianate Englishman." He had gone to Padua to continue his Latin studies and he is said to have caused Pius the Second to weep with joy at hearing such eloquence flow from English lips. Thomas Linacre came to Italy in 1488, became in Florence the friend of Lorenzo dei Medici and of Politian, graduated as a doctor of medicine at Padua and called Italy "Sancta mater studiorum." He was the first great Humanist and the foremost physician of his time, and was considered by Erasmus the introducer of medical science into England. In London he became Court physician with John Chamber, who had also studied medicine at Padua. He was the founder of the College of Physicians in London modelled on Italian institutions.

The efforts of the group of Oxonian scholars at Padua succeeded in establishing the new learning at Oxford and in extend-

* Lewis Einstein, "The Italian Renaissance in England." New York, Columbia University Press.

ing the Italian influence in England. The famous Doctor Cajus had also been a scholar at Padua and he founded at Cambridge a Medical College, which still bears his name.

The reputation of Padua as centre of learning was popular in England from old times.* Geoffrey Chaucer, who was in Lombardy on a diplomatic mission about 1372, quotes Padua in the prologue to "The Clerkes Tale":

> "I wol you telle a tale which that I
> Lerned at Padowe of a worthy clerk. . . .
> Franceys Petrark, the laureat poete."

Every alumnus at Padua prided himself upon his academic distinction and defended his peculiar Latinity. George Chapman in his comedy "All Fools" lets Costanza say:

> "You have a younger son at Padua
> I like his learning well—make him your heir."

In the first scene of "The Taming of the Shrew" Shakespeare pays his tribute to Padua. Lucentio explains the motive of his journey:

> "For the great desire I had
> To see fair Padua, nursery of Arts . . .
> I am arrived . . .
> And haply institute
> A course of Learning and ingenious studies
> And therefore Tranio . . . I have Pisa left,
> And am to Padua come, as he that leaves
> A shallow plash to plunge him in the deep."

But the fame of Padua as a centre of learning did not cease with the end of the Renaissance. It may be of some interest to quote here the first contact of one of the most prominent American physicians with the Paduan School. John Morgan, born in Philadelphia in 1735, where he received the degree of A.B. from the College of Philadelphia in 1757, went to Europe in 1760 to pursue his medical study. He spent in Europe five years and, when he came back to Philadelphia he delivered his famous "Discourse upon the Institution of Medical Schools in America" (1765), which was the most important contribution to the foundation of medical schools in the United States. In his "Journal" he tells of his visit to Morgagni, in July, 1764. Morgagni showed

* M. H. Spielman, "The Iconography of Andrus Vesalius, 1514–1564." London, 1525.

him many interesting preparations, told him of his new discoveries and "He was so good as to do me the honour of making me a present of his late publication, two volumes in folio 'De sedibus et causis morborum,' of which there have been three different editions within the three years, being in the highest estimation throughout all Europe, and all the copies of the late edition already bought up."

Very noteworthy is the importance in Padua of the Polish students, especially in the XVI century when after the spread of the Reformation in Germany it was necessary for the Polish students to go to Italy in order to complete their studies. Between the years 1544 and 1550 a great part of the teachers of the university of Cracow went to Padua leaving their schools: a Polish historian notices that often there is to be found in the acts of episcopacies of this time, near the name of certain high clergymen the remark "Proficiens in Italiam studii gratia" (gone to Italy in order to study). In the high places of the kingdom only those who had studied at Padua could be accepted, and we can calculate that the number of Polish students in Padua in the second half of this century was more than 1500. Nicolaus Copernicus, the great astronomer was a student at Padua from 1501 to 1504 and regularly matriculated in the Faculty of medicine: there seems to be little doubt that the discovery of the heliocentric system of the Universe can be dated from Padua.

Padua was the foremost school for non-Catholic students to whom inscription in the university of Cracow was forbidden. The greatest Polish physicians of the Renaissance were pupils of the Paduan university: Joseph Struthius, who was physician of the King Sigmond August of Holland and was considered one of the most learned men of that country, was one of the most illustrious Paduan pupils.

Not less important was the part of French students; Monsieur de Montaigne tells us in his diary that in 1580 more than 100 French gentlemen lived in Padua in order to frequent the schools.

The government of the Republic defended with the greatest authority the rights of the students who could freely send embassies to the Doge of Venice. When Pope Pius IV published the Bull "In sacrosancta" which prohibited non-Catholic students from obtaining the degree in medicine which was then conferred in church and in the presence on the ecclesiastical authorities the

graduate taking the oath of the gospel, the Republic instituted the conferment of degree by the authority of the college of physicians, and to the energetic protest made by the Vatican, Venice answered through Fra' Paolo Sarpi, the renowned scientist and Councilor of the Republic, that it was not thought necessary that an excellent physician should be profound in theology.

The old Paduan University had thus assumed with great dignity a political function. It had seen the transformation of the hall of an old inn called Il Bo', namely at the Sign of the Bull, a name which among the university students is current to this very day, into the magnificent historical hall in which thousands of inscriptions and of coats of arms tell the stories of masters and students. At the end of the XVI century a great international current starts from Padua to all the important centres of culture in the world.

The bright epoch begins in Padua with the work of Pietro d'Abano, a physician and philosopher, had its climax with Andrea Vesalius and Gerolamo Fracastoro, the founders of anatomy and pathology, and closes with the work of Galileo. These physicians of the Renaissance, who were at the same time humanists, men of letters and artists, saw with prophetic mind the solution of the great problems of life: the great blind man whose doctrines were solemnly condemned by the High Court of the Holy Office of the Inquisition in Rome had seen beyond his time and beyond the limits of human knowledge: he affirmed that the laws of nature are written in mathematical characters and that in order to achieve the truth it is first necessary to put experience before any discussion. From the Padua of the Renaissance, from the university where anatomical and physiological teaching had had the most important success, the beginning of experimental science was initiated.

ABSTRACTS OF THE PROCEEDINGS OF THE COLLEGE, OCTOBER TO DECEMBER, 1933

October 4

The Reading of History. (Abstract from the Mary Scott Newbold Lecture, XXXI.) By Sir Andrew Macphail, Kt., B.A., M.D., Ll.D., M.R.C.S., O.B.E., Professor of the History of Medicine, McGill University, Montreal. (*Published in Canadian Medical Association Journal, December, 1933.*)

The 31st Mary Scott Newbold Lecture was given by Sir Andrew Macphail on October 4th, 1933. By way of introduction he explained that medicine in America had two sources, the one in Philadelphia, the other in Montreal; and both streams were joined in 1885, when William Osler came to Philadelphia, bearing with him all he had learned at McGill. Both schools had a common origin in Edinburgh, upward in Leyden, and finally in London where Sydenham himself had created modern medicine.

Medicine, Sir Andrew affirmed, was a large part of life, and the history of medicine was the history of that life, since human activity was governed by sickness and health. Conquerors were arrested in their career by personal illness; armies were destroyed and the civil population decimated by epidemical disease. Civilisation was forced northward by the corruption of malaria, but it was returning southward again under the leadership of modern medicine.

For fifty years, he said, the history of Europe turned upon the perverse nature, the ill-temper, the jealousy of Elizabeth, all due to a physical cause; and the Stuarts who followed her were an invalid race dogged by ill health and the mental disability that always accompanies invalidism. The historians of all these periods were divided in opinion by birth, breeding, and temperament. Neither one side nor the other could be believed; the task of modern criticism was to find the truth, guided by historic intuition.

That relentless method was now being applied to the history of medicine, for it too had been vitiated by the same causes that falsified history in general. To illustrate the effect of religious

bigotry in falsifying history, Sir Andrew cited the diverse records of Servetus, of Galileo, and Darwin. He cited evidence that the Church had never placed a ban upon dissection or upon surgical operations; on the contrary, it was the Church that nourished medicine and rescued it from paganism and barbaric invasion.

Another source of error was the belief that everything was true because it was written in Greek or Latin. Quacks and pretenders could write in those languages as easily as they can write in English to-day. There were jesters and satirists in those days; and their jest and satire has been too freely accepted as fact. Nationalism also created prejudice. A somber page even of modern history records how base even men of the profession may be. Sydenham, Semmelweiss, Pasteur, Lister were the victims of their colleagues.

Sir Andrew ventured upon a forecast of the verdict which the future historian would render upon present physicians. He surmised that they will be described as spagyrists or iatro-biochemics, and the language in which they write impossible to understand. He suggested that the laboratory workers should strive for a universal language in symbols like mathematics, which would possess the simplicity, elegance, and symmetry of algebra, rather than the obscurity of phrases like "doubly adrenalectomized rats" and "hypophysectomized tadpoles."

The history of medicine, he concluded, was not an extinct creation to be examined by professional archaeologists alone; it was more swift and vital than ever before; it should interpenetrate the whole of practice; it should be taught not by professional historians alone but by the occupants of every chair, by the experimenters in the laboratories, and by the clinicians at the bedside to which medicine was once more returning after sojourning for forty years in a pseudo-scientific wilderness. But first, that history must be read correctly.

November 1

Experimental Chemotherapy and the Destruction of Spirocheta Pallida in the Brain. By George W. Raiziss, Ph.D., and M. Severac, M.D.

In order to study the efficiency of the various drugs used to combat neurosyphilis a new method was employed, based on the

recent discovery that rats and mice are capable of harboring an asymptomatic syphilitic infection in which spirochetes may be shown to invade various internal organs of these animals, and, in particular, their brain. In our experiments, mice were infected subcutaneously into the back with emulsion prepared from testicular lesions of syphilitic rabbits. One group of the mice were treated 24 hours after infection, to determine the prophylactic value of the drugs used, while the second group was treated three months after infection. The brains of the mice were removed three months after treatment, emulsions prepared from the brains and injected into testicles of normal rabbits. Non-appearance of lesions in these rabbits during six months of observation was taken as indicating that the dose of the drug administered to the mouse was curative, i.e., that the drug had penetrated into the brain of the mouse and sterilized it. While much further experimentation is necessary, and the results so far obtained must be regarded as tentative only and of a preliminary character, yet they seem to indicate that in sterilizing the cerebrospinal system of mice, arsphenamine is the most effective, and is followed, successively, by bismarsen, neoarsphenamine, acetarsone and tryparsamide. It, therefore, appears that trivalent arsenicals (arsphenamine, bismarsen and neoarsphenamine) are more effective when rated on the basis of the minimum therapeutic dose; this advantage is offset, however, by the lower toxicity of acetarsone and tryparsamide. Of these two pentavalent compounds, acetarsone appears to be therapeutically superior.

Discussion: *Dr. Alfred Gordon:* The treatment of neurosyphilis is still not entirely satisfactory. If one examines under the microscope an infinitesimal speck of the frontal lobe of a paretic and sees the numberless spirochetae running in all directions, one is not surprised at the difficulties in overcoming the causes of syphilis of the nervous system. However, in many instances of certain types of such cases, highly satisfactory results may be obtained, provided a method is used whereby continuous saturation with arsenicals is practiced.

Necessity for Revising the Common Conception of Focal Infection. By Myer Solis-Cohen, A.B., M.D.

In the common conception of focal infection attention is concentrated on the infected tissue rather than on the infecting bacteria. When the physician speaks of eradicating a focus of

infection what he really means is removing infected tissue, such as tonsils or teeth, or draining and cleaning out an infected cavity, such as a nasal accessory sinus. Infecting bacteria seldom are confined to a circumscribed area of diseased tissue but are present also on adjacent tissues, which may be apparently free from disease. Enucleation of diseased tonsils, for instance, does not necessarily remove the focus of infection because the infecting organisms may still remain in tonsillar stumps, in recurring tonsillar tissue, in infra-tonsillar lymphoid tissue, and on the apparently normal mucous membrane of the tonsillar fossae and the nasopharynx.

Such expressions as "removal" or "elimination" or "eradication of the focus of infection" therefore should be avoided when describing tonsillectomy or sinus treatment or operation.

The conception of focal infection should stress the bacterial element and regard the causal germ as the chief infecting agent.

In eliminating a focus of infection it is necessary to stimulate the production of bactericidins and other anti-bodies to destroy the infecting bacteria and render their toxins harmless, which sometimes can be done with hygienic measures but in many cases requires vaccine containing the proper antigens obtained from the infecting bacteria. The pathogen-selective culture selects the etiologically important organism from a mixed culture and the vaccine made from it contains both the endotoxins and the soluble exotoxins of the infecting bacteria. When the required specific antibodies have been produced in sufficient quantities to overcome the infecting organisms and their toxins the focus of infection can truly be said to be eradicated at both the primary and the secondary foci.

A Case of Attempted Suicide with Insulin. By Joseph T. Beardwood, Jr., M.D. (*Accepted for publication by the Journal of the American Medical Association.*)

A careful search of the literature for the past ten years revealed but one recorded case in which insulin was taken with suicidal intent, and in this case only 20 units of insulin were taken. The case reported, here, was that of a fifty year old white woman who had administered to herself apparently more than three hundred and fifty units of insulin in an attempt to commit

suicide. She was admitted to the hospital and in a period of twelve hours required a total of 1025 gms. of carbohydrate to bring her blood sugar up to normal. The patient had a positive Wassermann and showed some evidence of psychosis. She recovered without any apparent ill-effects from her attempted suicide.

Congenital Shortening of the Esophagus. By Dr. Willis F. Manges and Dr. Louis H. Clerf.

Twelve cases of congenital shortening of the esophagus with stenosis and the presence of a portion of stomach in the thoracic cavity are reported. The group consists of four children and eight adults. Two children were of one family, brother and sister. Two groups of symptoms were noted: one consisted of those resulting from esophageal obstruction and malnutrition; in the other, symptoms due to ulceration were present although there was mechanical obstruction. The esophagoscopic findings are those of narrowing of the lumen at the gastro-esophageal junction, a point above the normal hiatal level; in several, superficial ulceration was observed at this point. In seven cases, mucosa was removed from the food passage above the level of the diaphragm for histologic examination. This proved to be gastric mucosa.

The essential points in roentgen ray diagnosis are: first, that a portion of the cardiac end of the stomach must be shown to stay above the level of the diaphragm; and, second, the esophagus must be shown to be too short to reach as low as the level of the diaphragm.

There is narrowing of the esophagus anywhere from the seventh to the ninth thoracic vertebrae, and longitudinal rugae can be demonstrated in the thoracic portion of the esophagus.

Discussion: *Dr. J. T. Ullom:* I think the condition reported is not so rare as has been thought. I have seen three cases in the last two years, in two of which about two thirds of the stomach was above the diaphragm. I believe that these cases differ only in degree.

December 6

Advanced Methods in the Surgical Treatment of Facial Paralysis. (Abstract of the Mutter Lecture.) By Arthur B. Duel, M.D., New York City. (*To be published in Annals of Otolaryngology, March, 1934.*)

We distinguish between "Bell's palsy" due to refrigeration of toxic impairment of the nerve and "facial paralysis" resulting from such causes as neurosis, suppuration in the temporal bone, operative trauma, etc. Since the pioneer efforts of Drobnick in 1879 and of Sir Charles Ballance in 1895 successful anastamoses of the facial to the spinal accessory, hypoglossal, descendens noni and glossopharyngeal nerves have been performed by many surgeons. The best successes, however, were always marred by failure of emotional response in the facial expression and by the presence of associated movements.

Collaborating with Sir Charles Ballance, we demonstrated two years ago by animal experimentation that autoplastic grafts of any length whether reversed or unreversed would restore the function of the injured facial nerve with return to emotional facial expression and without associated movements. Since then, I have operated on 50 cases of facial paralysis in 35 of which the injury required a graft. In 32 of these, the graft was 15 mm. or more in length; the average length of all was 20 mm. One case required 4 grafts aggregating 150 mm. in length. As source for the graft, I first used Bell's anterior respiratory nerve, later intercostal nerves; more recently evidence that sensory nerves are as efficient as motor nerves led me to employ the anterior femoral cutaneous. Any length required can be secured from this nerve, and the destruction of it results only in a small area of anesthesia on the thigh and this subsequently tends to disappear through collateral innervation. Grafts have been successfully placed in purulent fields in more than half of my grafted cases; an infected field is not a contra-indication to the employment of these nerve grafts. Complete hemostasis is not essential. If the ends of the graft are closely approximated, a small amount of clot from oozing blood makes the best fixation for the graft; but the blood must not come between the graft and the adjacent nerve.

By preparing in advance the nerve to be used for the graft and permitting Wallerian degeneration to develop in it in situ

for from two to three weeks, the quality and rapidity of repair after grafting has been greatly improved; the first response with such grafts has been obtained in one third the time required after fresh grafts. Finally, it has proved possible to employ heteroplastic grafting at least when the donor and recipient belong to the same blood group.

When during operations in the neighborhood of the facial nerve slight accidental trauma to the nerve takes place, recovery of the nerve may be perfect or almost perfect. Nevertheless, the uncertainty as to the seriousness of the trauma has convinced me that any facial paralysis following accidental operative trauma should be uncovered at once and the case treated according to the lesion that is found, varying from simple drainage, to slitting of the nerve sheath or immediate repair by autoplastic grafts.

In a series of experiments on ten rhesus monkeys, I uncovered the nerve and split the sheath over a distance of 10 to 15 mm. Nine of the ten suffered no facial paralysis or loss of faradic response. One gradually lost faradic response with evidence of complete Wallerian degeneration after nine days. Seventeen days later, faradic response began to return and in six weeks the face had apparently recovered. The actual trauma involved in splitting the sheath, if carefully performed, does not necessarily cause facial palsy.

I then induced facial palsy in a series of monkeys by exposing and freezing the nerve with ethyl chloride. One case was left without splitting the sheath: all the other cases had the nerve sheath split open over the frozen area and a few mms. distal and proximal to that area. The cases in which the nerve sheath was split recovered facial movements in one half the time that it required for recovery in the other cases.

In a series of monkeys in which facial palsy had been induced by the injection of 90 per cent alcohol into the nerve, the cases in

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Fig. 1. Top. Case 5 (F. A.). Facial graft 10 mm.; from anterior cutaneous nerve (prepared by degeneration in situ). Left: Before operation. Right: 9 months after operation.

Middle. Case 6 (M. F.). Facial graft 7 mm., double strand, heteroplastic; from anterior femoral cutaneous nerve (prepared by degeneration in situ). Left: Before operation. Right: 17 months after operation.

Bottom. Case 8 (N. S.). Bell's palsy; right side, 6 months; left side, 11 years; double decompression. Left: Before operation. Right: 17 months after operation.

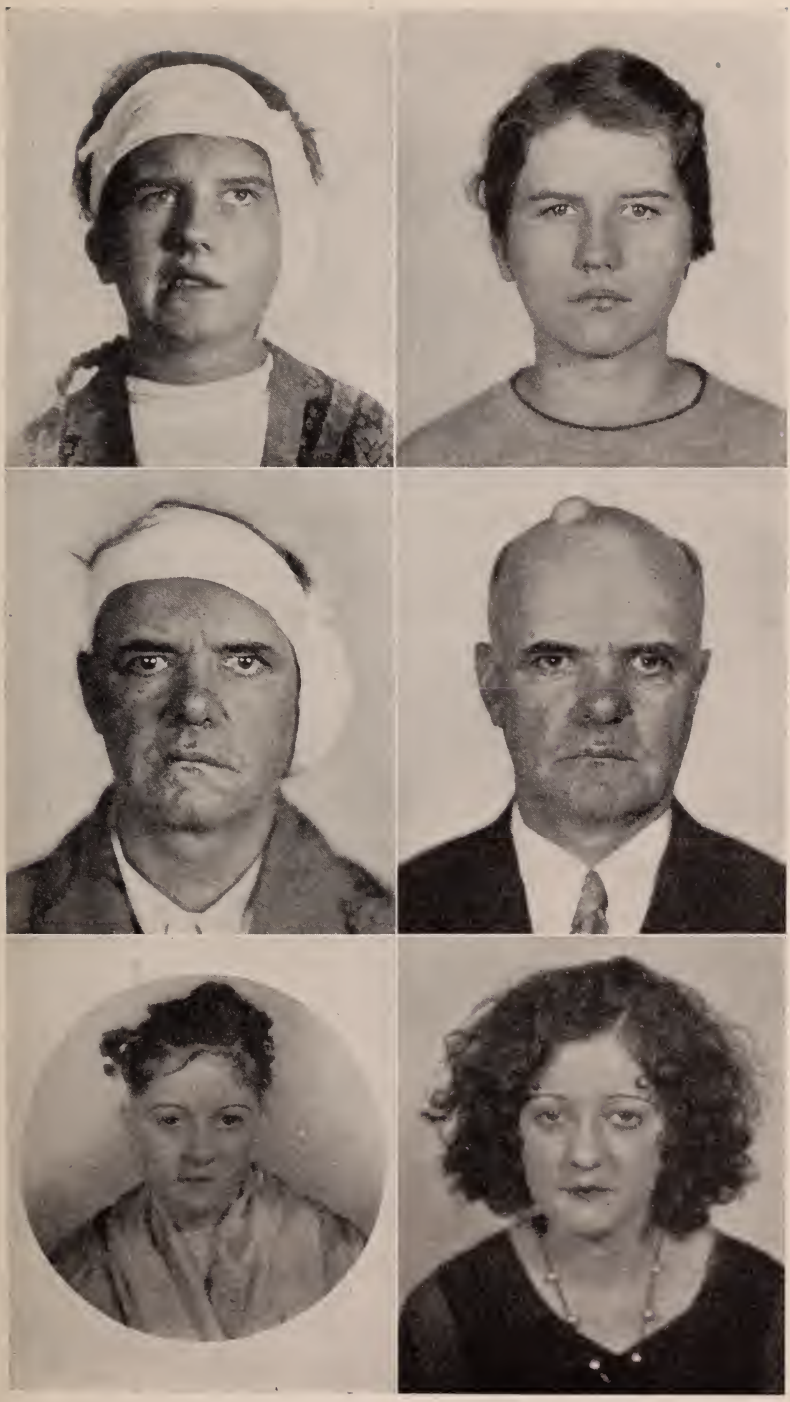

Fig. 1.

which the nerve sheath was split over the area of toxic involvement recovered twice as rapidly as those in which the sheath was not split.

Fortified by this experience I summoned up sufficient courage to split the sheath of the nerves of several cases of Bell's palsy in which the recovery was very poor and had remained unchanged for many years. In every instance, despite the long period of inactivity, the relief of the pressure by splitting the nerve resulted in a very marked improvement.

One case in which a double Bell's palsy had rendered the patient very grotesque, has been relieved to the point of making possible equal and synchronous movements of both sides of the face.

Perhaps cases of Bell's palsy which had failed to improve over a long period, let us say several months, might take the chance of a very much greater improvement by being subjected to surgical intervention (decompression of the nerve by splitting the sheath) rather than to go on with almost certain grotesque deformity throughout their lives. I realize that this is almost heretical, certainly very audacious, but I am convinced that eventually it will be the accepted procedure. It will necessitate a careful observation of a large number of cases so that one will be able to say 'such and such a case which has now failed over such and such a length of time to make any definite improvement will probably go on for the rest of his life without recovery if left unoperated: that such a case will probably make a very definite—possibly almost complete—recovery, if operated early.'

PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY, OCTOBER TO DECEMBER, 1933

(*These proceedings will appear in abstract in the Amer. Jour. Ophthalmol. and in the Archives of Ophthalmol.*)

October 19

Dr. T. B. Holloway: "Detachment of the Retina Cured by Electro-Coagulation." Exhibition of Case.

Dr. Sigmund S. Greenbaum: "The X-Rays in Chronic Seborrhoeal Blepharitis." Discussion by: Dr. Zentmayer and Dr. de Schweinitz.

Dr. Francis Heed Adler: "Apparent Complete Optic Atrophy with Preservation of Normal Visual Acuity." Discussion by: Dr. Holloway and Dr. Adler.

Dr. Alfred Cowan: "The Newer Forms of Bifocals." Discussion by: Dr. Crampton, Dr. Adler and Dr. Cowan.

Dr. Edmund B. Spaeth: "Clinical Determination of the Light Threshold." Discussion by: Dr. Cowan.

November 16

Dr. Alfred Cowan: "A Method of Fixation for Mapping Central Scotoma."

Dr. Warren S. Reese: "Drusen of the Fundus." Exhibition of Case. Discussion by: Dr. Holloway.

Dr. W. E. Fry (by invitation): "Tuberculosis of the Choroid in a Monkey."

Dr. C. E. G. Shannon and Dr. Leo F. McAndrews: "A Diabetic and Tobacco Amblyopia." A Case Report. Discussion by: Dr. Peter.

Dr. Luther C. Peter: "The Treatment of Retinal Detachment by Electro-Coagulation." Exhibition of Cases. Discussion by: Dr. Holloway and Dr. Peter.

December 21

Dr. Charles R. Heed: "Epibulbar Sarcoma." Exhibition of Case. Discussion by: Dr. de Schweinitz, Dr. Holloway, Dr. Griscom and Dr. Heed.

Dr. Gomon (by invitation): "A Peculiar Superficial Hemorrhage into the Cornea." Discussion by: Dr. Shipman, Dr. Cowan and Dr. Holloway.

Dr. J. Milton Griscom: "Dystrophy of the Cornea and Iris." Exhibition of Case. Discussion by: Dr. Cowan, Dr. Zentmayer and Dr. de Schweinitz.

Dr. Luther Kauffman (by invitation): "Heterochromic Cyclitis." Exhibition of Case. Discussion by: Dr. Zentmayer.

Dr. George E. de Schweinitz and Dr. Alfred Cowan: "Clefts in Descemet's Membrane—An Unusual Slit Lamp Picture." Discussion by: Dr. Cowan.

Dr. Edmund B. Spaeth: "Bilateral Choked Discs with Nerve Fibre Involvement Simulating Binasal Hemianopsia."

Dr. Perce DeLong: "Primary Tumor of the Optic Nerve." A Preliminary Report.

PROCEEDINGS OF THE SECTION ON OTOLOGY AND LARYNGOLOGY, OCTOBER TO DECEMBER, 1933

October 18

Enucleation of the Tonsil During an Attack of Quinsy for Relief of Recurrent Hemorrhage. By Dr. H. A. Rothrock.

The case was that of a woman who had been suffering from quinsy for a few days and was referred because of profuse bleeding from her throat. She had been in good health until the sore throat developed five days before and this became worse and was accompanied by periodic hemorrhages. When first seen at her home, the bleeding had stopped but because of its return she was sent to the hospital. Her throat showed a picture typical of left sided peritonsillar abscess but in addition blood clots and detritus were exuding from the crypts of the inferior portion of the tonsil. She was put at rest in bed but this did not suffice for severe bleeding began again. It was then decided to incise the plica triangularis and, if necessary, enucleate the tonsil to locate the bleeding point in spite of the danger of opening avenues for generalized infection. The plica was very thin and, when incised, there was a free flow of blood. A large clot was found in the upper part of the tonsillar fossa which had dissected the tonsil loose; the outer layer of the capsule was apparently intact. The outer part of the tonsil had sloughed to a considerable extent and the adjoining tissue was dark bluish red. The condition was interesting because it was possible to see the deeper parts of the tonsil during an acute attack of retrotonsillar inflammation. The patient made an uninterrupted recovery.

Discussion: *Dr. G. M. Coates:* I think this case of Dr. Rothrock's is very interesting and well presented and brings up two or three points well worth discussing. I have never seen a case that bled through the tonsil in my practice. As to opening spaces for infection, I have never been in favor of tonsillectomy in the presence of acute infection. Several men from Texas, some years ago, advocated operation in the course of acute quinsy. I have thought, as Dr. Rothrock has said, that the best course is to open the quinsy and later to enucleate the tonsils.

It is interesting that Dr. Harry Barnes of Boston mentions in his book a case so similar to the one reported by Dr. Rothrock.

Dr. Benjamin H. Parrish: During the World War, a certain naval doctor operated on a number of cases in the presence of quinsy and ran into serious trouble. He had several deaths and was ordered by the Department to desist.

Dr. H. A. Rothrock: I used the term quinsy in the paper because pus was in the retrotonsillar space, though the infection started in the tonsil. The bleeding was in the retrotonsillar space and the condition should really be called a retrotonsillar abscess.

Acute Ethmoiditis in an Infant with Unusual Complications. By Dr. Charles A. Pryor.

An infant two months old showed, at first, restlessness and mild fever. Swelling appeared in the region of the right ethmoid and lower eyelid extending to the right side of the face, right central incisor area and hard palate. A purulent discharge developed from the right nostril from beneath the inferior turbinate. The temperature reached 103° and the leucocyte count, 25,100. X-ray examinations showed only cloudiness over the right ethmoid region. Incisions were made over the local swellings with escape of pus, mostly from the regions of the right lower eyelid, right maxillary and right first molar tooth. Each incision was followed by marked improvement. Complete recovery was the outcome.

At first, it was undecided whether the lacrimocystitis or ethmoiditis was the primary factor for both were present. According to J. Parsons Schaeffer, occlusion of the nasal end of the nasolacrimal duct at birth is fairly common. Some have ruptured at as late an age as two months. The piling up of debris in the duct accompanied by infection could cause a condition such as in this case. Extension of pus to the hard palate might be due to a low opening of the duct in the nose, with the pus dissecting along the floor of the nose beneath the muco-periosteum via the naso-palatine foramen.

Discussion: *Dr. Warren B. Davis:* I congratulate Dr. Pryor on getting a better result than I did in two similar cases. One was a thirteen-day old infant in which a probe, which was offered no resistance, passed from the canine fossa directly into the sinus. The child died of multiple abscesses. The other case, which I saw with Dr. Le Fever, showed an orbital abscess which he opened at the inner and outer angles and which I opened through the nose and ethmoid. This child died of

meningitis as we had feared would happen. All children have the ethmoid sinuses developed at birth but they are apt to vary from a small groove to a number of large cavities.

Dr. Charles A. Pryor: When first seen, I thought the case might be one of malignancy. The probe seemed to strike ragged bone and it seemed to be a question whether we should open the ethmoid at once but we determined to incise where the pus pointed.

Fatal Hemorrhage from the Great Vessels, Probably Jugular, Secondary to Cervical Adenitis. By Dr. M. Valentine Miller.

A boy of nine, with a past history of tonsillectomy, recurrent sinusitis and otorrhea, developed a right-sided sore throat and cervical adenitis of about three weeks duration. Examination showed a bulging in the right lateral pharyngeal wall and enlargement behind and beneath the right sterno-mastoid muscle. Temperature varied from 100° to 101° and he was not toxic. Temporary improvement followed treatment for a sinus infection, but six days later swelling in the neck and throat returned and increased. Pharyngeal incision gave only some clotted blood and incision behind the sterno-mastoid yielded a large mass of clotted blood and broken-down lymph node.

Spontaneous bleeding from the throat later could not be controlled by pressure in the pharynx or by clamping of the common carotid artery and ended fatally. It is believed that the sore throat, together with the sinusitis produced the cervical adenitis probably with erosion into the jugular vein. Postmortem search through the operative wound was not successful in finding the bleeding point, but the lack of pulsation over the swellings, the darkness of blood constituting the hemorrhage and the inability to control the bleeding by clamping the common carotid all point to a jugular origin. Review of the literature yielded only one other case of erosion of the jugular vein but several of erosion of the carotid artery with retropharyngeal bleeding.

Discussion: *Drs. Coates, Wood, Shuster, Batson and Hunter.*

Allergy a Constant Factor in the Etiology of So-called Mucous Nasal Polyps. By Dr. Richard A. Kern and Dr. Harry P. Schenck.

Although infection has been the accepted etiologic factor for mucous nasal polyps yet dissatisfaction with this view has been

expressed by a number and the existence of a constitutional factor has been suggested which the writers call allergy. Billroth, in 1855, from histologic studies recognized "mucous polyps" as true hypertrophies of the mucous membrane in all its parts. Zuckerkandl and many other writers on the subject since then have supported the theory of inflammatory origin but statistics showed, as Skillern in 1910 pointed out, that polyp formation may occur without suppuration. A vascular origin for mucous polyps was suggested by Coakley, Yonge and Williamson. Lymph-vascular disease was offered as a cause by Williams and a constitutional or hereditary factor has been suggested from time to time since the earliest writings on the subject.

According to tables, shown of clinical cases, the authors indicate that the incidence of nasal mucous polyps is strikingly high in allergic diseases of the respiratory tract and extremely low in non-allergic diseases. Their incidence also is greatest in the perennial and protracted allergic cases therefore overlapping those seasons of the year when respiratory infections are prevalent. They believe that in a majority of cases the protracted action of allergens produces a swollen mucosa, which continued into the seasons of the year when respiratory infections are common, prepares the way for bacterial hypersensitivity. In a minority of cases, there occurs first an infection with an infectious swelling of the mucosa and eventually, if the patient is of the allergic strain, there can supervene a true bacterial hypersensitiveness. This latter will continue to keep the mucosa in a swollen state, but the swelling is then no longer inflammatory (red, congested) but allergic (pale, edematous, hyperplastic). The edematous mucous polyp is therefore the ultimate degree of allergic change in the mucosa. The treatment of mucous polyps must then include attention both to possible atopic hypersensitiveness as well as to the bacterial factor.

Discussion: *Drs. Babbitt, Coates, Clark and Dunn.*

November 15

Recent Experimental Work on Physiology of Hearing. Its Significance to the Otologist. By Dr. M. H. Lurie.

By placing an electrode on the eighth nerve of a cat and connecting this with an amplifying apparatus of the radio type, an

exact reproduction of sounds, sent into the cat's ear was heard in the loud speaker. This discovery made in 1930 has been named for its originators, the Wever and Bray phenomenon, and has opened a new field for research concerning the physiology of hearing. At the Harvard Medical School, under Professor Davis, Dr. Saul and the author, interest was chiefly centered in the analysis of this phenomenon, in determining what happens in the cochlea and in tracing the auditory nerve impulses through the auditory tracts to the cortex of the brain.

The cochlear response, which resulted from a sound wave entering into the membranous cochlea was studied best with an electrode at the round window or sub-arcuate fossa and was found to be not nerve impulses or action currents but an electrical response similar to that of the telephone system, with the organ of Corti as its probable source. It is believed that bending of the hair cells sets up electrical disturbance like that of "broadcasting," which reproduces accurately the sound sent into the cat's ear and probably stimulates the nerve endings to initiate the nerve impulses which travel to the spiral ganglion and thence to the auditory tracts in the brain.

The nerve impulses were detected by the electrical disturbance, or "action currents" associated with them, and traced from the eighth nerve through the brain stem. It was found that sounds up to 2800 vibrations per second were reproduced by the nerve impulses and traced as far as the geniculate body. Above 2800 no tone was detected in the auditory tract but simply a rushing noise. Impulses traveling up the auditory tract were therefore no longer synchronous with the vibrations making up the sound. As the nerve impulses pass from lower to higher nuclei they become more non-synchronous. Above the medial geniculate body they are sent as nerve impulses to the cortex and probably here interpreted as sound.

The greatest value to the otologist will be the placing of the theory of hearing on a firm foundation, thus enabling us to understand and to treat more intelligently deafness occurring from various pathological conditions.

Demonstration of Electrical Auditory Responses. By Professor H. Davis, assisted by Dr. A. J. Derbyshire and Mr. L Garceau.

A cat was demonstrated under avertin anaesthesia with the skull opened and electrodes placed on the round window, eighth nerve and inferior colliculus. From these areas sounds produced by voice, watch and tuning-fork when transmitted into the cat's ear were reproduced in a loud speaker. Rushing noises were demonstrated when the sounds were picked up by electrode along the auditory nerve pathways.

Discussion: *Dr. Edward Lodholz and Dr. D. W. Bronk.*

December 20

Dr. Chevalier Jackson: "An Average Day at a Bronchoscopic Clinic." (Lantern slide demonstration.)

Dr. W. Wayne Babcock: "Plastic Closure of Laryngostomic Fistulas." (Lantern slide demonstration.)

Dr. Emily Lois Van Loon: "Tracheobronchial Foreign Body with Negative Roentgen Ray Findings." (Lantern slide demonstration.)

Dr. W. Edward Chamberlain: "Normal Calcifications of the Laryngeal Cartilages mistaken for Foreign Body." (Lantern slide demonstration.)

Dr. N. M. Levin: "Analysis of One Hundred Cases of Hemoptysis referred for Diagnostic Study." (Lantern slide demonstration.)

Dr. C. L. Jackson: "Contact Ulcer of the Larynx." (Lantern slide demonstration.)

Discussion: *Drs. Tucker, Batson, Babbitt, Coates and Parrish.*

PROCEEDINGS OF THE SECTION ON GENERAL MEDICINE, OCTOBER TO DECEMBER, 1933

October 23

A Case of Ocular Pemphigus (Essential Shrinkage of the Conjunctiva) with Stricture of the Esophagus. By Frieda Baumann, M.D. (by invitation).

Case Abstract: M. K., age 61, seen first two years ago in a state of extreme malnutrition and dehydration, showed ankyloblepharon of the left eye, symblepharon of the right eye except for the circle of the cornea, and trichiasis of both lids. There were deep ulcers surrounded by inflamed areas and scar tissue over both hard and soft palate.

The bladder, rectum and vagina showed no evidence of involvement of mucus membrane. There were no lesions of the skin characteristic of any type of pemphigus. Roentgenographic studies of the oesophagus revealed a benign stricture of the oesophagus at the level of the suprasternal notch. Oesophagoscopy revealed a tight stricture about 3 cm. in length just below the circopharyngeus.

A diagnosis of essential shrinkage of the conjunctiva (ocular pemphigus) with stricture of the oesophagus was made.

The patient's general condition was greatly improved by dilatation of the stricture of the oesophagus and general supportive treatment including a high caloric and high vitamine diet. During two years observation the ocular lesions have not progressed and no new lesions of the mucus membranes can be demonstrated.

Comment: The etiology of this rare disease is unknown. There is considerable difference of opinion concerning the actual nature of the disease. Shrinkage, the characteristic lesion of the mucus membranes, is not in any way similar to the lesions of any of the types of skin pemphigus. The course is chronic. No cases have been recorded as cured. There is considerable evidence suggesting that so-called ocular pemphigus is a distinct lesion of the mucous membranes and is not manifest clinically or pathologically by lesions characteristic of pemphigus. It is suggested that

these cases be designated as essential shrinkage of the conjunctiva and mucous membranes with vesicle formation until an etiological factor is determined.

THE CLINICAL AND ROENTGENOLOGIC RECOGNITION OF COARCTATION OF THE AORTA. By Morris Kleinbart, M.D. (by invitation), and Hugo Roesler, M.D. (by invitation).

Three new cases were described. The classic findings are: (1) systolic murmur over the interscapular area and over the precordium; (2) palpable arterial pulsations over the interscapular area and lower borders of the posterior ribs; (3) blood pressure increased in the upper extremity and higher there than in the femoral; delay in the pulse in the femoral; (4) decreased amplitude of pulsation in the femoral; (5) decreased or absent palpable pulsation in the abdominal aorta; (6) forcible systolic thrust in the suprasternal notch and vessels of the neck; (7) x-ray findings: erosions of lower borders of the ribs; absence of the prominent aortic knob usually associated with hypertension; at times absence of 3d left aortic arc; inability to trace out the aortic knob.

THE ROLE OF THE BLOOD PLATELETS IN CLOT RETRACTION. By Leandro M. Tocantins, M.D. (by invitation), and Harold W. Jones, M.D.

It has been pointed out by many observers that the platelets play no part in clot retraction. Many instances have been found, however, of irretractile clots in the presence of a normal number of platelets.

From the observations of the microscopic appearance of a drop of platelet-rich hemophilic plasma, it was noted that only a small number of platelets are destroyed during the process of coagulation. It was thought, then, that the undestroyed platelets, that is, platelets that have remained undestroyed during and after completion of the process of coagulation, are the ones responsible for clot retraction.

Destroyed and undestroyed platelets were added in varying amounts to several equal specimens of platelet-poor (purpuric) human blood. It was found that retraction took place in the tubes to which an adequate number of undestroyed platelets had

been added, and that it was absent in tubes to which a corresponding number of destroyed platelets had been added.

Varying amounts of antiplatelet serum in varying concentrations were added to equal specimens of human blood with a normal platelet content. It was observed that clot retraction was absent in the tubes to which greater amounts of the serum had been added, or in which the serum had been added in higher concentration, and that increasing degrees of clot retraction were seen as the concentration of the serum added was less.

Other tests using normal serum, fresh human serum, normal rabbit serum did not invalidate these results. It is suggested that it is not the absolute number of platelets in any one specimen of blood that is responsible for clot retraction, but the number of undestroyed platelets remaining after coagulation has taken place.

The Distribution of Sugar and Chloride in the Blood of Diabetic Individuals. By Ennion S. Williams, M.D. (by invitation), and F. William Sunderman, M.D.

The distribution of glucose and chloride between the corpuscles and the serum has been studied in the blood obtained from diabetic patients and normal individuals. In both the diabetic and normal blood the glucose was found to be approximately equally distributed throughout the water of the corpuscles and the serum.

The distribution of the chloride in the water of the cells and the water of the serum of diabetic blood did not differ essentially from the distribution found by other investigators in normal and pathological blood.

No consistent relationship was observed between the level of glucose and the level of chloride either in the whole blood, corpuscles or serum.

November 27

Report of a Case of Myelogenous Leukemia in the Aleukemic Phase with Aneutrophilic Angina and Recovery from the Latter State. By Harold L. Goldburgh, M.D.

The patient is a widow, age 70 years. Following an injury to her right knee in May, 1931, she developed a marked hemoar-

throsis, at which time the w.b.c. was 9,100 per c.mm. with a normal differential count. An enlarged liver and spleen were first noticed in April, 1932. At this time the leukocyte count was 16,000, of which 40 per cent were myelocytes and 4 per cent myeloblasts; a form of chronic myelosis.

In December, 1932, she developed Ménière's syndrome. In February, 1933, after the continued use of Fowler's solution 5 minims t.i.d. the white cell count dropped to 8,000, after which she developed several abscessed teeth. These were removed without any immediate complications. The leukocytes continued to drop so that by the end of February they reached 2,000. At this time she developed a fever of undetermined nature, following which the leukocytes continued to drop to 1,400 reaching 900 per c.mm. March 16th.

The pernicious neutropenia was present for 4 days prior to the onset of the ulcero-membranous stomatitis and pharyngitis. On March 8th there was a complete absence of all the neutrophiles from the peripheral blood. The patient was gravely ill.

Following the institution of pentose nucleotide, non-specific immuno-transfusions, His' leukocytic extract and liver extract, she recovered from the aneutrophilic angina.

When the temperature reached normal, after a period of 20 days, the leukocytes began to rise rapidly so that within 5 days the white cells rose from 1,400 with 27 per cent neutrophiles, to 5,000 per c.mm. with 63 per cent neutrophiles.

The patient is clinically improved although her blood still showes evidences of a chronic myelosis. In this instance the blood studies indicate that the neutropenia preceded the gangrenous ulcers in the mouth by 4 days. If any part of the treatment afforded benefit we are inclined to believe that the immuno-transfusions were useful during the febrile and neutropenic state.

THE PROBLEM OF SO-CALLED CATARRHAL JAUNDICE. By H. L. Bockus, M.D., and Henry Tumen, M.D.

The term "catarrhal jaundice" is applied to a condition which is well delineated clinically although its pathogenesis is still obscure. The older conception that duodenal or biliary catarrh is responsible has been succeeded by the hypothesis that hepato-cellular disturbance is the underlying cause and at the

present time it is thought by many that all cases of so-called catarrhal jaundice are due to this.

Because it has been stated that the galactose tolerance test is positive when there is acute liver-cell disease, the response to this test was used in our series of 23 cases. These were all of less than four weeks duration. In 18 of them the response to the test was positive, in 5 it was negative. Since there were cases in the negative group in which sufficient time had not elapsed to permit restoration of normal hepatic function the positive and negative cases were compared in a number of ways. It was noted that in those patients who had a positive galactose test the jaundice was more apt to be prolonged and splenic and hepatic enlargement were more prevalent. Evidence of continued biliary obstruction and of biliary catarrh, however, occurred chiefly when the galactose test was negative.

It is suggested that if the galactose tolerance test, splenic and hepatic enlargement and evidence of biliary obstruction and catarrh are used as criteria it may be possible to differentiate two types of so-called catarrhal jaundice, the first due to hepato-cellular disease and the second to obstructive biliary catarrh.

The Use of Mechanical Devices for Elevating the Diaphragm and the Effects in Pulmonary Diseases (a Preliminary Report). By Burgess Gordon, M.D.

A group of normal individuals and patients with various pulmonary diseases were studied to determine the influence of posture, increased abdominal weight, and the effects of wearing abdominal supports upon the level of the diaphragm, and upon pulmonary manifestations. It was found that obesity raised the level and decreased the excursions of the diaphragm. A similar influence was found from the use of abdominal supports. With an increase in the elevation of the diaphragm there was an almost immediate decrease in dyspnea, cough and expectoration. The group studied included patients with tuberculosis, bronchiectasis, and pneumoconiosis.

Arsenoxide in Relation to the Toxicity and Therapeutic Activity of Arsphenamine and Neoarsphenamine. By Jay Frank Schamberg, M.D., John A. Kolmer, M.D., and Herman Brown, B.Sc.

(1) The naphthoquinone color test (Rosenthal) for arsenoxide has been found highly sensitive for the detection of this substance in solutions of arsphenamine and neoarsphenamine aerated with oxygen or exposed to the air.

(2) The test is much less sensitive for the detection of arsenoxide in the tissues after the administration of the arsphenamines. After the intravenous injection of 0.100 gm. of arsphenamine in rabbits, arsenoxide was found in the liver in about 0.5 mgm. per gram of tissue and in about 0.1 mgm. per gram of kidney. None was found in the muscles. After the intravenous injection of 0.200 gm. of neoarsphenamine per kilo, arsenoxide was found in about 0.3 mgm. per gram of kidney but none in the liver or muscles. With smaller amounts of arsphenamine and neoarsphenamine, arsenoxide could not be detected in these tissues.

(3) Freshly prepared solutions of arsphenamine and neoarsphenamine do not contain detectable amounts of arsenoxide by this test.

(4) When approximately 34 per cent of arsphenamine in alkalinized solution was oxidized into arsenoxide with oxygen the toxicity was about doubled.

(5) The amounts of arsenoxide in solutions of neoarsphenamine produced by oxygenation or exposure to air did not correspond nearly as closely with the results of toxicity tests as was observed with oxidized solutions of arsphenamine suggesting that with neoarsphenamine at least, arsenoxide is but one factor in toxicity.

(6) One lot of neoarsphenamine free of arsenoxide was unusually toxic for the rat. When a solution of this was oxygenated the production of arsenoxide was about the same as observed with lots of neoarsphenamine of much lower toxicity. It would appear therefore that tests for arsenoxide in commercial samples of neoarsphenamine will not prove of any practical value in determining the toxicity of these compounds.

(7) The presence of arsenoxide in solutions of arsphenamine and neoarsphenamine tends to shorten the latent period for try-

panocidal effects when injected intravenously into rats with trypanosomiasis but does not appreciably change the minimal curative does per kilo of weight as compared with freshly prepared solutions free of arsenoxide. In some tests with neoarsphenamine the presence of arsenoxide appeared to reduce the minimal curative dose.

(8) The presence, however, of approximately 34 to 36 per cent arsenoxide in solutions of arsphenamine and neoarsphenamine not only hastened spirocheticidal effects in rabbits with acute testicular syphilis but likewise reduced the minimal curative dose of each compound about one half. It would appear therefore that arsenoxide is more spirocheticidal than trypanocidal.

December 18

Psychotherapy and the Psychoneuroses in General Practice. By Lauren H. Smith, M.D.

Considerations regarding etiology, diagnosis and symptomatology are largely omitted in this presentation in order to concentrate upon the practical features of treatment and handling first of the patient who has psychoneurotic features present in the medical or surgical illness and second the patient who definitely has a psychoneurosis.

The causes of psychoneurotic reaction types giving rise to "psychoneurotics" is considered as unknown; all etiologic explanations of the present day are without consistent substantiation. The point of view is presented which considers each individual as an integrated organism, wherein the mind and body are functionally unified. The psychoneurosis is the result of a partial defeat in adjustment of this organism to its environment, and such defeat may come through either a mental or physical avenue or through both, with possibly the same end result.

Treatment, therefore, should be given to the entire organism or individual, covering each and all mental and physical factors in proportion to their importance in influencing the condition as found at the examination of the patient.

The ideal treatment of the acutely ill psychoneurotic is contrasted with the types of treatment in vogue and with those found by the psychiatric specialist to be practically useful. Finally

consideration is given to the treatment by the general practitioner, with the emphasis placed on the part the family physician may play in preventing severe or chronic psychoneuroses through early use of psychotherapy in the daily practise of medicine.

Syphilitic Fibrosis and the Status of the Iodides in the Present-day Treatment of Syphilis. By Sigmund S. Greenbaum, M.D., and John Cobane, M.D. (by invitation).

A description of syphilitic fibrosis in the form of fibroid gumma, as originally described by Lutz and Jeanselme, was given together with a description of two illustrative cases. These cases were illustrated by photographs and histologic sections. Another type of fibrosis in connection with syphilis was described and the case illustraed by photographs. Previously reported cases of fibroid gumma were discussed with respect to cause and therapeusis. Most of these have regressed almost or quite completely under therapy with an organic arsenical or with bismuth as is true of the cases reported at this time. Taking these types of syphilitic fibroses as a text, it is shown that both bismuth and the arseno-benzenes have fibrolytic powers in the presence of syphilitic fibroses and that, inasmuch as these drugs produce both spirochetocidal effects and at the same time beneficial effects upon the positive serology in syphilis, they are preferable to the iodides which have neither of these qualities and are only non-specific in their action. It was emphasized that these drugs not only have the same fibrolytic power attributed to the iodides but, for reasons noted, are preferable under a great variety of circumstances; iodides are rarely indicated in acute and less commonly in instances of chronic syphilis than was the practice some years ago.

Therapeutic Pneumothorax in Experimental Lobar Pneumonia in Dogs By Simon S. Leopold, M.D., and Louis M. Lieberman, M.D. (by invitation).

Therapeutic pneumothorax on the affected side in lobar pneumonia has been used by foreign clinicians since 1919. Fifty patients have been reported as treated with 47 recoveries and 3 deaths. Their ages ranged from 6 weeks to 62 years. The usual number of treatments was two and the average amount of

air injected was 400 c.c. at each treatment for adults. All those who have published their case reports enthusiastically recommend this treatment. They state, that following the induction of pneumothorax, there is promptly initiated a series of events indistinguishable from the true crisis, with profuse sweating, fall in temperature, pulse and respiration, and immediate relief of pleural pain. The improvement is temporary for on the disappearance of the pulmonary compression all of the previous symptoms return. When the compression is maintained for 48 hours or more, the pathologic process terminates and convalescence ensues. Because the pleura is highly absorptive it is usually necessary to repeat the treatment in 18 to 24 hours. Two injections usually suffice.

Despite these almost incredible reports in the literature, we were unwilling to treat patients on this evidence alone and, therefore, studied this problem in animals. Thirty-six dogs were given lobar pneumonia; 18 were treated with artificial pneumothorax and 18 were used as controls. Of the treated dogs, 15 recovered and 3 died. Of those untreated, 5 recovered and 13 died. The effect of treatment on the dogs was similar in all essential respects to that which has almost invariably been observed in man. Fourteen of the 36 dogs had positive blood cultures during life.

This treatment is not advocated as a routine procedure in all cases of lobar pneumonia. In selected cases where the lesion is unilateral it can be employed with reasonable safety. The danger of circulatory collapse from cardiac and mediastinal displacement incident to treatment must be kept in mind. There is ample justification for its use in a large series of patients. Lobar pneumonia is emphatically not the disease in which to acquire experience in the technique of artificial pneumothorax.

Lantern slides were used to summarize the cases reported in the literature. Another series of slides showed the clinical charts, blood cultures and leukocyte counts in 4 treated dogs, together with their daily roentgenograms before and after treatment.

The Mechanism of Split Heart Sounds. By Charles C. Wolferth, M.D., and Alexander Margolies, M.D. (by invitation).

The time relations of split first heart sounds to ventricular ejection were studied in two cases with bundle branch block, in

two with intraventricular conduction defect and in six cases with normal electrocardiograms. Ventricular ejection was measured by the relation between the QRS complex and the upstrokes of aortic and pulmonary artery pulses. Left ventricular ejection was checked in certain cases by electrocardiogram-carotid artery tracings. When the first heart sound is split there is asynchronism in ejection from the ventricles significantly greater than in controls with single first sounds. The first sound component precedes ejection from one ventricle and the second sound component precedes ejection from the other ventricle by about the same interval.

Additional evidence was obtained by study of vibration amplitude of split first sounds. We have previously shown the influence of the A–V interval on the amplitude of first heart sound vibrations. It was found that with varying A–V intervals both components of the split sound showed variations independent of each other. However, in one case in which adequate studies were made it was found that each component of sound varied identically with respect to its own time relation to the P wave.

It was concluded from the above data that one component of a split first sound is left ventricular in origin and the other right ventricular. This is the important duality in the first sound rather than muscular and valvular elements.

Aortic closure falls approximately 0.02 second before the dicrotic notch (incisure) of the carotid artery and pulmonic closure 0.06 to 0.13 second after beginning descent of the V wave in the veins of the neck. By taking combined tracings of sounds, carotid artery and jugular vein it can be determined when the second heart sound is split, that one component is aortic and the other pulmonic. Each can be identified.

PROCEEDINGS OF THE SECTION ON MEDICAL HISTORY, OCTOBER TO DECEMBER, 1933

October 9

Dr. Wm. G. Leaman: "The History of Physical Diagnosis."

November 13

Joint Meeting with the Philadelphia Psychiatric Society

Dr. Howard W. Haggard, Yale University (by invitation): "What a Frail Sunday-School Teacher Did for Medicine and Humanity."

Dr. Charles W. Burr: "How a Yorkshire Tea Merchant and His Descendants Effected a Great Medical Reform."

Dr. Francis R. Packard: Motion Picture Exhibition Illustrating "The Advent of Anesthesia."

December 11

Dr. Ward Brinton: "Presentation of an Old Doctor's Bill of Benjamin Rush."

Dr. Hubley R. Owen: "History of the Medical Department of the Philadelphia Police."

Dr. Burton Chance: "Dr. Wm. Coward, Whose Works Were Ordered Burned by the Public Hangman, by Order of the House of Commons."

Dr. Robert Charr (by invitation): "Fragmentary History of Ancient Chinese Medicine."

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NOTICE

The present volume of the TRANSACTIONS has been issued in three numbers representing the papers read from January to December, 1934, before the College and its Sections. While a few of the papers have been presented in full, most of the Proceedings are in abstract or by title only, giving when possible the reference to place of complete publication.

The volume includes also Supplement No. 1, being "An Account of the College of Physicians of Philadelphia," a second edition revised by Dr. G. E. deSchweinitz and W. B. McDaniel, 2d, Ph.D.

The College holds itself in no way responsible for the statements or opinions set forth in the various papers or abstracts in its TRANSACTIONS.

Edited by

J. HAROLD AUSTIN, M.D.

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Supplement No. 1, December, 1934

An Account of the College of Physicians of Philadelphia. A Second Edition. Revised by G. E. deSchweinitz and W. B. McDaniel, 2d.

MEMOIR OF DR. WILLIAM HENRY WELCH *

By DAVID RIESMAN, M.D., Sc.D.

In my life as a doctor I have met three men and only three who exercised a personal influence of such magnitude that they dominated the medicine of their time. These three men were Osler, Billings and Welch. Differing in mental endowment and in ancestral background, each had a personality that separated him from his fellowmen. Osler typified what is still comparatively rare in America, the scholar in medicine. To him is largely due the growing interest in the humanities among medical men, although that is not his only claim to fame. He pointed out in his writings and in his teaching the value as well as the charm of clinical or bedside study. Throughout the land his younger contemporaries and his successors have striven to emulate him as a teacher, to be second Oslers. Frank Billings was not a profound scholar. The humanities attracted him but little. With the magnificent frame of a pioneer in a pioneer region, he had time mainly for the practical things of life and left the ornamental to others. Forthright, clear-thinking, generous, a first-rate doctor and far-visioned educator and organizer, he acquired an extraordinary influence through the length and breadth of the land. His direct personal influence on the host of young men who came within the range of his personality made devoted disciples of them. They became Billing's men, keen clinicians, able diagnosticians and safe counsellors in the crises of life.

Welch did not come from a raw and sparsely settled country as did Osler, nor from the striving and restless middle West as did Billings; he was the product of the best stock in an old and long-settled community, a stock that has impressed itself upon our nation as no other. In the little town of Norfolk, Connecticut, and in the immediate neighborhood the Welches had lived for generations, mainly following the profession of medicine. He himself was the tenth Dr. Welch in the family. His father,

* Read January 7, 1935.

William Wickham Welch, a beloved practitioner, was to the old citizens of Norfolk the most famous of the entire Welch line. To him his son William erected a fountain with the beautiful legend, "Fons sum solati, talis et ipse fuit"—"I am the Fountain of Comfort as He was Himself." From such an ancestry in which culture and self-assurance had been at home for generations, Welch inherited the personal dignity and the charm of bearing that were his striking possession. He was at home in any circle—the great men of capital and business, statesmen, the highest military officers, even Presidents were proud to be his friends. His figure was not a commanding one—he was short, stocky, thick-necked and obese, nevertheless he was the central point in any gathering, medical or nonmedical.

Welch had the gift of friendship in a rare degree. Courteous, kindly, tolerant, not given to sarcasm, free from the superiority complex to which more than anyone else he was entitled, he had no enemies. In some men that might signify a weak character, one unwilling to assert itself. That was not true of Welch. At scientific meetings he never hesitated to criticize a speaker with whom he did not agree, but he always did it with such fine tact, with such good nature, that he did not make an enemy of the man he criticized. At the banquet given in his honor in 1910, Councilman said, "Has any man ever heard Welch speak ill of his neighbor?"

Welch was born in 1850 and was sent to Yale College at the early age of sixteen. At that time the Classics still dominated education, so that together with the Sciences, he acquired a knowledge of Latin and Greek which he increased by teaching these languages for a year after graduation. It can perhaps not be proved, but personally I feel that the type of education he received—largely humanistic—made it possible for him to become the all-round scholar that he was. I am not reconciled, and I doubt whether Welch was reconciled, to the elimination of the so-called dead languages from the college curriculum. In truth they are not really dead for they are still the sources of the Language of Science. To Welch Latin and Greek were more than two more languages. They were the key to two more civilizations. It is, I agree, no longer necessary to give them the main place in the college curriculum. Even so sturdy a defender of Greek as DuBois-Reymond after having first pleaded

for Greek as a requirement for a medical education, late in life cried out "more conic sections and less Greek."

After teaching Latin and Greek for a year Welch entered the College of Physicians and Surgeons in New York City. With prophetic vision he soon saw the value and need of chemistry, and this induced him to return to New Haven for advanced studies in that and kindred fields. He took courses both in the Sheffield Scientific School and in the Yale Medical School and was greatly stimulated by Professor Oscar Allen and by George Frederick Barker, afterwards Professor of Physics in the University of Pennsylvania. Welch became deeply interested in the new chemical theories propounded by Kekulé, the originator of the benzol ring concept of organic compounds. Within a year he had mastered the exciting theories in the original German. On completing these important studies, Welch in 1872 re-entered the College of Physicians and Surgeons where the course of instruction had recently been extended from two terms of four months each to three terms of five months each. Through the influence of Francis Delafield, one of the founders of pathology in this country, Welch began even as an undergraduate to make autopsies at Bellevue Hospital and to study morbid changes with the microscope. He had won the Seguin Prize, a Varick microscope, for the best report of the clinical and didactic lectures of Seguin, famous professor of nervous diseases. His graduation thesis on goiter not only won for him the first prize but also in its preparation taught him the use and value of medical bibliography.

Six months before graduation Welch was already acting as intern at Bellevue Hospital. Here he came in contact with a brilliant group of men such as Francis Delafield, E. G. Janeway and Abraham Jacobi. A number of others also influenced him at this formative period—Charles McBurney, Alonzo Clarke, Austin Flint and Alfred Loomis. At the end of a year and a half's internship Welch, accompanied by his friend Frederick S. Dennis, set sail for Europe. For him and for American medicine this proved to be a momentous step. The Civil War had interrupted the migration to Europe which in the earlier decades of the century had taken some of the best men to Paris, London and Edinburgh. Germany was just beginning the wonderful work in medicine, in chemistry, in biology, that eventually made her the Mecca for eager learners from all parts of the world, a position

she lost with other intangible things as the result of the Great War. Strassburg, which the Germans had raised to a university of highest rank, was Welch's first stopping place. Here he worked with Waldeyer in histology, with Hoppe-Seyler and Baumann in biochemistry, virtually a new science at that time, and with von Recklinghausen in pathology. After a short stay at Strassburg he went to Leipzig where he found many other foreigners in the famous physiological laboratory of Carl Ludwig. Majendie, Charles Bell, Johannes Müller, Claude Bernard in the earlier part of the century had blazed the way that was now being followed with brilliant results in physiology by Helmholtz, by Du-Bois-Reymond and by Ludwig. Welch discussed with Ludwig the advisability of working with the mighty Virchow * but Ludwig, who was not completely won over to the cell-doctrine, suggested that Welch instead go to the youthful Julius Cohnheim in Breslau, which was a happy choice and proved of decided importance for Welch's future. As we shall see later it was Cohnheim's recommendation that largely influenced President Gilman of Johns Hopkins University to offer the chair of pathology in the new medical school to Welch.

In Cohnheim's laboratory Welch was associated with Karl Weigert, to whom pathology owes many important discoveries, including valuable methods of staining tissue elements in preparation for microscopic study. Others in Cohnheim's remarkable institute were Ehrlich, Lassar, Neisser and Salomonson. The atmosphere was electric. Everyone was pursuing some individual problem assigned to him by the master. That of Welch was the ascertaining of the causes of acute general edema of the lungs. The result appeared in an essay that is still a classic; it was written by Welch in German and printed in Virchow's Archiv essentially as Welch had prepared it. A number of years ago I had occasion to read this article. At that time I thought that someone had translated it from Welch's English into good German. It did not seem possible that anyone not a native or long familiar with the German tongue could have written it in the vernacular.

Summer vacations in Europe were used by Welch for walking tours. During one short holiday he walked 210 miles in Switzer-

* Nevertheless, Welch's admiration for Virchow was unlimited. He recognized in him the pioneer, the master—il maestro di color che sanno—and put him on a pedestal with Vesalius and Harvey.

land. That was good exercise for a man inclined to be stout and gouty.

While at Breslau Welch had a memorable experience that helped to shape his subsequent career. He was present when Robert Koch arrived to show Cohnheim his bacteriologic discoveries which consisted at that time chiefly in isolating and growing microorganisms—it was still five years before the discovery of the tubercle bacillus.

On Cohnheim's advice Welch went to Prague to visit Edwin Klebs, who was then engaged in his fruitful studies on acute endocarditis and diphtheria. From Prague he passed on to Vienna. He was disappointed in the opportunities he found there for the object he had in view, the study of embryology. Nevertheless, his stay there in the fall of 1877 proved invaluable. He entered with zest into the cultural activities, into the music and art life of the gay Austrian capital, the gayest then as it is the saddest now. After the winter in Vienna he returned to Strassburg to continue his studies with von Recklinghausen, who was one of the leading representatives of the Virchow school of pathologists. As a suitable *Arbeit* von Recklinghausen assigned to Welch the study of the inflammation of the frog's cornea induced by various caustic chemical agents. This study was intended to determine the origin of the pus cells, a question which at the time, the late 70's, was the cause of intense and bitter controversy between the Virchow and the Cohnheim schools. Was the pus cell an emigrated leukocyte of the blood as Cohnheim contended or was it the product of the multiplication of the fixed tissue cells? Although Welch's experiments seemed to favor the latter, the Virchow theory, he was not willing to draw any far-reaching conclusions on the basis of his own researches. Indeed it required many years of further observation and experimentation before the final proof was brought that connective tissue cells under the influence of chemical stimulants become motile and multiply so as to surround and to invade the chemically altered area.

His work at Strassburg being completed, Welch spent a few delightful days in Paris and then paid a second visit to London. Here he found the medical world in a fever of excitement over Joseph Lister's bold surgical exploit of opening the knee joint. We of today can hardly understand this excitement unless we remember that antisepsis was still in its infancy.

His *Wanderjahre* being ended Welch was ready to turn his steps homeward. He had studied under some of the best masters in the world. The phrase that I have just used is rarely heard in this country. We would say a man went to Pennsylvania or Harvard, to Yale, to Johns Hopkins, but in Germany a man studied under this or that professor. The distinction is significant. When our universities become real universities in fact as well as in name, than a man will study under such and such a master rather than at such and such a place.

Welch was back in New York in the spring of 1878 trying to see whether anyone prepared as he was could find work in that great city. As he needed to earn a livelihood he was for a time undecided whether to stay in New York or whether to join his aging father in the practice of medicine at Norfolk. At that critical moment he fortunately fell in with Dr. Goldthwaite, a well-known quiz master. The quiz was, as Welch long afterwards put it, a life-saver. But he abandoned the work after three years because he felt that it injured both the students and himself. The identical conclusion was reached by many of us in Philadelphia who as students and as teachers had experience with the quiz system.

During this probationary period in New York a little practice came to him from his old teacher Alonzo Clark but it did not divert him from his main objective, the study and teaching of pathology. His Alma Mater offered him a lectureship in pathology but as it did not provide a laboratory he with some heartache accepted the offer of the rival school, Bellevue Hospital Medical College, where three small rooms for the purposes of a laboratory were assigned to him. This constitutes in a sense an historic event for it was the first recognition in this country of pathology as an independent discipline. Soon, however, the College of Physicians and Surgeons realized the need of a similar chair and offered it to Welch. He declined, feeling that he could not desert his friends at Bellevue and suggested T. Mitchell Prudden for the place. With the latter's prompt appointment pathology was definitely established as a branch of medical education coequal in importance with anatomy and physiology. To Virchow belongs the credit of having done this originally, for it was he who raised pathology to a definite science.

Welch's work in New York in teaching and investigation soon

attracted attention. One day a man came into the room while Welch was lecturing on syphilis and without making himself known remained throughout the teaching period. The visit had momentous consequences for the silent visitor, John S. Billings, had come to select a man to fill the chair of pathology at the new hospital and the contemplated medical school in Baltimore. President Gilman, one of the greatest educators in the history of this country and one of the best judges of men, planned to create a medical school on new principles. Welch, recommended not only by Billings but also by the influential Julius Cohnheim, received the first appointment to the faculty. In that manner a pathologist became the head and real founder of the Johns Hopkins Medical School. Realizing the growing importance of bacteriology and his own need of knowing it in order to fit himself for his new position, Welch returned to Germany in the summer of 1884. After a year of intensive study he came back thoroughly at home in the newer bacteriologic methods of Robert Koch. He began his work at Johns Hopkins Hospital in 1885, several years before the medical school was opened. His energy and magnetism drew to him a group of men whose names are now household words, Councilman, Abbott, Nuttall, Halsted and later Flexner, Barker, Mall, and MacCallum.

In the choice of the major faculty of the Johns Hopkins Medical School Welch exercised a paramount influence. It was through him that Halsted was called from New York, and Osler and Kelly from Philadelphia. What that remarkable quartet meant for medicine in America I need not discuss. Its influence continues to this day after all but one of the four have died.

Welch was the dominant figure in the new medical school and rapidly extended its reputation far beyond the confines of Baltimore. Everywhere, in all medical faculties, Welch's personality began to be felt. His influence upon medical education was manifold and in its totality was unquestionably greater than that of any other man in the history of this country. It is not easy to analyze it for it was all-pervading and touched on many fields. One outstanding phase was the making of pathology a required fundamental branch in medical teaching. With Prudden and Delafield he was instrumental in raising pathology, including bacteriology, to a position coequal in importance with that of anatomy and physiology. It was natural that in such an undertaking he

should emphasize the value of the laboratory. As a result of this emphasis practically every medical school of importance and even many hospitals established pathological laboratories. Some were for research as well. What this meant for the progress of medical science in this country cannot be overestimated. Compared with Germany the spirit of research was but poorly developed in this country when Welch established his laboratory in Baltimore.* He attracted to himself a group of eager young men who advanced so rapidly in reputation that they were called upon to fill chairs in other medical schools. In that way Welch's influence reached out over the length and breadth of the land. Councilman went to Harvard, Flexner to Pennsylvania, Lafleur to Montreal.

One reason for Welch's remarkable influence was that he, better than anyone else of his time, was aware of the trend of medical education. With unparalleled vision, he sensed instinctively the direction in which medicine ought to go in order to progress and thus it was that in time he became general educational consultant to medical schools, which rarely adopted a new policy or filled professorial chairs without seeking his advice. Welch was the foremost champion in the medical profession of the so-called full-time system of teaching. One may differ about the wisdom of full-time clinical chairs, at least on the plan originally conceived, but it cannot be denied that the academic type of medical teaching is rapidly extending.

In line with Welch's work for medical education were his efforts in promoting the founding of great research institutions, in particular the Rockefeller Foundation and the Rockefeller Institute, whose benefactions very nearly reconcile one to the accumulations of great wealth in single hands.

A large share of credit must also be given to him for the physical improvement in medical schools which until the early nineties were for the most part but poorly equipped. In 1890–91 there were only five endowed chairs in medical colleges and not a single one of these south or west of Philadelphia. On the other hand there were 171 endowed chairs of theology, many of these being in the west and south. In 1892 the productive funds in the hands of the medical schools were $611,214, for theological schools $17,599,979. While it would be an exaggera-

* A distinguished professor of physiology in a German university once said to Welch, "When America does wake up to the necessity of these things (medical laboratories) then let Europe look to its laurels."

tion to say that the reversal of this relationship now obtaining was chiefly due to Welch, his powerful far-flung influence was always exercised in the direction of the physical and pedagogic improvement of medical schools.

As Commissioner of Health of Maryland, a position he held for many years, Welch set a standard for similar officials in other states; indeed in all great events of national and state action for public health Welch was the man to whom everyone turned for advice both in formulating plans and in selecting personnel. He laid down the lines of action in the great campaign against tuberculosis in this country, and they have been followed throughout the world.

Upon Philadelphia medicine Welch's influence was far greater than is generally known. The Phipps Institute, to whose Board of Trustees he belonged from the beginning, depended upon him for wise counsel and stimulus. He was consulted upon faculty appointments in the medical schools and upon other matters of educational policy. At the opening of the William Pepper Clinical Laboratory Welch delivered the principal address, which was a masterpiece of historical study of the origin and growth of laboratories. What Dr. Welch did for Philadelphia was in a general way duplicated, often on a much larger scale, in other cities.

Dr. Welch was an Honorary Fellow of this College and in 1920 became Custodian of our Cabinet of Relics on the resignation of Dr. Simon Flexner. In 1924 he resigned the custodianship in favor of Dr. W. W. Keen, on whose death the honor fell to Dr. Wm. J. Mayo.

When Welch reached the age of 66 years, he resigned his Professorship of Bacteriology at Johns Hopkins University, not however to seek the *otium cum dignitate* to which he was so well entitled. On the contrary he took upon himself the Directorship of the School of Hygiene and Public Health, a position he filled with undiminished ability for ten years. At the ripe age of 76 his friends may have expected that he would decide to retire, but Welch was not the man to rust out. Instead of seeking a life of leisure he began a work which in the future may prove almost as significant for American medicine as anything he did in his life. Supported by generous benefactors he created out of nothing an Institute of Medical History and the wonderful library bearing his name. After he was appointed to the new position he spent

two years abroad gathering rare books in all parts of Europe. His unequaled bibliographic knowledge made it possible for him to collect a significant library, such as was never collected before in so short a time. The Institute, modeled after the famous Leipzig Institute of Professor Sudhoff, is destined under Welch's successor, Dr. Henry E. Sigerist, to play an important role in the cultural life of America.

The appointment of Welch to the Directorship of the Institute of Medical History was not a mere gesture to a deserving man but a proper tribute to one who knew the history of medicine as well as any man *vom Fach*. William Osler once said, adding to a phrase of Oliver Wendel Holmes, "In addition to a three story intellect Welch has an attic on top." In that attic was stored a vast amount of cultural knowledge. And what was as remarkable as the contents of his multistoried brain was the fact that on the spur of the moment he could call upon his memory for details that often gave the impression of careful, lengthy preparation. His memory was truly colossal. He could lecture for an hour or more on historical subjects without making a mistake in dates or sequence. I heard him give the first William Wood Gerhard address before the Pathological Society of Philadelphia. It was, appropriately to the occasion, on the history of typhoid fever. Without notes he began at the beginning, went through the early 19th century to Gerhard and then down to modern times without an error and without halting for a word. It was a phenomenal performance that no one present can ever forget.

When Welch reached his eightieth birthday a celebration of truly cosmic proportions took place. In Washington, President Hoover attended, and speaking to the 1600 assembled guests he called Dr. Welch "our greatest statesman in the field of public health." Nearly all large cities of the world held simultaneous celebrations. I am sorry to say that Philadelphia's name glares by its absence from the list. Welch's address on this occasion was a model of modesty and charm. One of the speakers said, "Dr. Welch waded knee-deep in honors unsought and aroused no shadow of envy or enmity on the way." To the truth of this all who knew Welch personally can testify. No man in medicine was ever so deep in the hearts of his contemporaries.

Welch's enormous influence upon his generation, indeed upon two generations, was due to a combination of gifts. First and fore-

most was that of good health, with its accompaniment of zeal and vigor, and the second curiosity; curiosity that was not satiated by the triumphs of medicine but extended to literature, to art and to music. His interest in the intangible things that we call the humanities kept pace with his scientific interest. With the scholarship of an Erasmus, the integrity and tolerance of a Contarini, the scientific zeal of a Virchow, he was, I believe, the finest exponent of humanism in the history of medicine.

Dr. Welch left no children in the flesh, a disappointment to the eugenist, but no man in the history of American medicine has left a larger number of spiritual offspring, a form of immortality, beyond theology and dogma, reserved only for the greatest of men.

If now, in conclusion, we place William H. Welch before our mental eye to see why he had such a colossal influence upon men and events, we find that he was an all-around personality—not only a doctor, not only a scientist, not only an historian, not only an educator, not only a scholar in literature and languages—he was all these at one and the same time.

Nature unfortunately is parsimonious in such men.

MEMOIR OF DR. JAY FRANK SCHAMBERG *

By F. D. WEIDMAN, M.D.

To THE medical world at large Jay Frank Schamberg was a dermatologist and syphilologist. The books he wrote, the researches he conducted, the scientific meetings in which he so freely participated, his private practice, and the teaching he did were of that field. Five years ago, when I asked Dr. Bruno Bloch whom he regarded as the most outstanding dermatologist in America, he replied that Dr. Schamberg was the best known, at least on the continent. The same situation holds good for Philadelphia medicine but with additions; he was president of the Philadelphia County Medical Society and in the earlier years of his career was active in the anti-smallpox campaign, which met the same opposition here in Philadelphia that it did elsewhere. It is eminently fitting that he be memorialized before this college.

Personally, Dr. Schamberg was the polished gentleman. He was punctilious in attire, which was emphasized by spats and black-ribboned eyeglasses, almost unique among Philadelphia physicians of this generation. In any gathering, medical or otherwise, he was always the distinguished personage; indeed, except by those who know him better, he might be charged with a certain aloofness. Widely traveled and intellectual in his own right, he was always at perfect ease in the conversazione. His enjoyment was most obvious as the host at the head of his table in the company of visiting physicians and graduate students.

In his methods he was meticulous; his native caution did not interfere with the energies necessary to develop plans and policies. I am told that his golf game was similar; he played it for all it was worth, never taking chances or lapsing into carelessness.

Dr. Schamberg was truly Philadelphian. He was born here November 6, 1870, graduated from the University of Pennsylvania School of Medicine in 1892 and served as resident physician at the University Hospital. After studies in Vienna, Paris, Berlin,

* Read January 7, 1935.

Hamburg and London, he became lecturer on infectious eruptive diseases at the University, where he was also associated in the dermatological clinic with such pioneers in American dermatology as Duhring, Hartzell, Van Harlingen, and Stelwagon. He was Professor of Dermatology and Syphilology at Temple School of Medicine from 1910 to 1918 and at Jefferson Medical College from 1918 to 1920. From 1918 to 1934 he was Professor of Dermatology and Syphilology as well as Vice-Dean in the Graduate School of Medicine at the University of Pennsylvania.

Outside of Philadelphia, Dr. Schamberg was known in administrative capacities as the President of the American Dermatological Association (1920–1921); as Chairman of the Section of Dermatology and Syphilology of the American Medical Association (1928 to 1929) and as a member of the House of Delegates (1904) of the American Medical Association. He was a member of the Editorial Board of the Archives of Dermatology and Syphilology from 1927 until his death. In the face of all these distinctions, however, the part he played in synthesizing arsphenamine during the World War will always stand as his monument. With remarkable promptness this drug became available at a time when the supply from Germany was almost completely cut off.

In the field of dermatology and syphilology he created the symptom-complex "progressive pigmentary dermatosis" which is also designated "Schamberg's disease." He played a large part in establishing the clinical and etiological entity known as straw-itch. He was an active crusader against the anti-vivisectionists, including the anti-vaccinationists.

Philadelphia dermatologists will never forget Dr. Schamberg for his faithful attendance at, and devotion to, the Philadelphia Dermatological Society. While his natural reserve still followed him here, he was nevertheless always approachable by the younger members and gave freely of his store of knowledge and experience. One of his most valuable contributions to dermatology was his discussion of case presentations before both our local and national dermatologic meetings—models of completeness and clarity.

Dr. Schamberg was a prolific writer, to say nothing of the impetus which he gave to his associates, particularly at the Institute of Cutaneous Medicine which he was so instrumental in founding. He was the author of "Skin Diseases and Eruptive Fevers," and "Compendium of Diseases of the Skin." He was

co-author of "Acute Infectious Diseases" and "Treatment of Syphilis."

The last years of Dr. Schamberg's life, including the one as President of the Philadelphia County Medical Society were borne with characteristic courage and tenacity, compromised in health though he was, by the cardiovascular disease which finally took his life. He died March 30, 1934, in Philadelphia. He leaves behind a widow, a daughter and a son, Ira L. The latter is now a resident physician at the Philadelphia General Hospital.

To Philadelphia medicine, to his chosen professional field and to a host of warm professional and personal friends he leaves a rich heritage of pleasant memories and human accomplishment.

MEMOIR OF DR. THEODORE H. WEISENBURG *

By CLARENCE A. PATTEN, M.D.

Medical men leave their imprint upon the science and practice of medicine by the character of their scientific contributions or the influence of that more subtle thing we call personality. Not infrequently scientific work speaks for itself and needs not the addition of other factors. Occasionally the advance of a science is accomplished very largely through the stimulation and enthusiasm afforded by one of strong personality. Sometimes both the type of mind adapted to science and a forceful personality are combined in one person, and in this category can be placed Dr. Theodore H. Weisenburg. Because of these outstanding qualities he made a marked contribution to the prestige of neurology, both in this country and abroad. His intellectual keenness, fortified by aggressiveness and persistence and amplified by definite qualities of leadership, readily placed him in his later years in the front rank of neurologists.

He was largely inspired in his work by two men. by Dr. Charles K. Mills, with whom he was actively associated in the early years of his medical career, and by the writings of Dr. Hughlings Jackson, whom he considered the greatest of all neurological philosophers. Some of his most valuable literary contributions were written with Dr. Mills, and one or two of them have been epoch-making.

After completing his internship and serving nearly two years as a contract surgeon in the Army in the Philippine Islands, Dr. Weisenburg entered private practice in Philadelphia. He was not particularly interested in general practice, however, and spent as much spare time as he had, in the neurological wards of Blockley. After eighteen months he decided to devote his entire time to neurology and became an assistant to Dr. Mills in the Philadelphia General and University Hospitals. He was appointed Instructor in Neurology in the Medical School of the University

* Read January 7, 1935.

of Pennsylvania in 1903 and was rapidly promoted. An evidence of his seriousness of purpose and his ambition is shown in the production in 1903 of five papers on neurological subjects. It is perhaps somewhat understandable that two of these five papers should deal with the subject of facial paralysis, for his initial interest in neurology probably developed as an emotional response to his own neurological affliction, a peripheral facial paralysis occurring at the age of two years.

In 1904 appeared his first neuropathological paper, and also his first evidence of interest in the subjects of aphasia and the functions of the cerebellum, both of which subjects formed the basis of important work in later years. In 1906 he wrote a paper on the developments and possibilities in neuro-surgery, and showed his interest in cerebral localization by the publication of a paper with Dr. Mills on that subject. In that paper the authors claimed that the higher psychic functions were located in the prefrontal lobes. Some years later, however, both changed their opinions somewhat and taught that there was no special area of the brain subserving pure intellectual functions, but that because of the rich association-fiber systems psychic activities must be considered a function of the whole brain.

In 1907 Dr. Weisenburg was appointed Professor of Neuropathology and Assistant Professor of Neurology in the Medico-Chirurgical College of Philadelphia and, some years later, Professor of Clinical Neurology. He shared the teaching of neurology with Dr. Charles S. Potts until the merger of the school with the University of Pennsylvania in 1916.

From 1903 until 1911 Dr. Weisenburg wrote and published between forty and fifty papers, about half of the total for his entire life. As early as 1908 he showed considerable interest in the organization of neurological instruction in both under-graduate and graduate teaching. He outlined courses for both in a paper read before the Section of Nervous and Mental Disease of the American Medical Association, of which he was the Chairman in 1908. This is perhaps prophetic considering his later activities as the Vice-Dean of Neurology-Psychiatry in the Graduate School of Medicine, beginning in 1920 and continuing until his death in 1934.

In 1912 Dr. Weisenburg called attention to the value of motion picture analysis in the study of neurological diseases and condi-

tions. He had been engaged in photographing neurological and other medical conditions for a period of five years and accumulated some 10,000 feet of film. He was definitely a pioneer in this field, and it was characteristic of him that he quickly took advantage of any advances that could be applied to neurological medicine.

In 1914 there appeared the memorable contribution of Drs. Mills and Weisenburg on "Cerebellar Symptoms and Cerebellar Localization," which was referred to in many foreign journals and initiated a vast amount of research in this country and abroad. In the ensuing ten to fifteen years the cerebellum was subjected to experimental, physiological and pathological investigations of so intensive a character that its functions became clearly defined and understood. It is of interest that the localizations outlined by these authors have stood the test of time and the scrutiny of research investigation.

In 1916 Dr. Weisenburg, with several associates, made a survey of the cases of poliomyelitis occurring in the epidemic of that year. They studied over 700 cases, correlating the medical and neurological aspects of the disease in a paper published in 1917, which was of considerable value to the medical profession then and later.

In June, 1916, the Medico-Chirurgical College closed, and Dr. Weisenburg was without teaching opportunities until the opening of the Graduate School in 1920, at which time he became Professor of Neurology. His attention and interests, however, were quickly taken up by the problems arising with the War. He was made the Military Director of a Government Training School for Neurology, Psychiatry and Neuro-surgery in Philadelphia and organized courses on these subjects. In addition he was one of the authors of a Manual of Neuro-Surgery which was compiled at that time and which is still in use in the government service. In 1918 he was ordered to active duty as a Major in the Medical Reserve Corps and was assigned to the Army Hospital at Plattsburgh Barracks, New York. Here he distinguished himself by the organization and institution of an "atmosphere of cure," which was so highly successful in quickly rehabilitating psychoneurotic patients. He was later transferred to the Columbia War Hospital in New York City, where he was solely concerned with peripheral nerve injuries. He was greatly interested in these cases and learned much that was of value to him in his later teachings and writings on sensory and motor neurology.

From 1910 to 1920 he published only fifteen papers, but it is noteworthy that the character of his work had distinctly changed. In this time more fundamental considerations of certain neurological problems such as aphasia, cerebral functions and cerebellar localization replaced scattered case reports and brief considerations of the more common neurological diseases.

During the next decade, 1920–1930, he was actively engaged with graduate medical education and the problem of raising the standards of specialty work in neurology in America. Of more importance than all else, however, was his appointment in 1920 to the position of Editor-in-Chief of the newly created Archives of Neurology and Psychiatry. This position afforded him an outlet for his highly developed critical sense and for an expression of his ideals regarding scientific work in neurology. Largely through his stimulation and his personal devotion to Archives work the standing of American neurology was raised to a plane never before reached. He was ably assisted in this work by other leaders of neurology in the United States, who were always in deep sympathy with his aims and gave him continued cooperation.

Between 1925 and 1928 his interests carried him still further in the direction of fundamentals, and during this time he laid the foundation for his most noteworthy contribution, a book on aphasia. This book was completed but a few weeks before his death. While dealing with the problem of aphasia he became interested in the study of normal values in sensation and critically analyzed all the work that had been done on this subject. Through grants from the Commonwealth Fund of New York he began research in 1928 on both aphasia and normal sensation. As a result of his work and interest in sensation he was made President of the Association for Research in Nervous and Mental Disease in 1933–34 and started the preparation of a program on the subject of "Sensation, Its Mechanisms and Disturbances." Others continued the arrangement of the program after his death, and it was creditably given on December 27 and 28, 1934.

As a result of psychological studies in aphasia it was found that there were no satisfactory standards for the measurement of adult intelligence, and, therefore, with the collaboration of the psychologists who were engaged in the aphasia work with him, a series of tests were devised which formed the basis for a second book to be published soon.

Dr. Weisenburg will be recorded among the outstanding men of his time in neurology because of his work on aphasia and the cerebellum. He will be regarded as a real benefactor of neurology because of his leadership as editor of the official American neurological publication, the Archives of Neurology and Psychiatry. He will be remembered as a forceful teacher, an able executive, a keen critic and one whose whole medical career was devoted with rare persistence to the advancement of his chosen specialty neurology.

MEMOIR OF DR. JOHN BERTON CARNETT *

By WILLIAM BATES, M.D.

John Berton Carnett was born in Williamsport, Pennsylvania, October 30, 1876, the oldest of five children of Addison H. and Laura Apkar Carnett. At the age of thirteen he left home to work his way through high school. He graduated with first scholastic honors and showed unusual ability in athletics. For the next year he worked in the woods with his father, who was superintendent of timber lands in northern Pennsylvania. With the earnings of this year as a nucleus he started his medical course in the University of Pennsylvania Medical School. He rowed on the crew the first two years and played on the Varsity football team in the second, third and fourth years.

He maintained himself by newspaper writing, yet, in spite of all these activities, he graduated in June 1899 with high honors and passed State Board examinations in third place. He then started a two year internship at the University of Pennsylvania Hospital and continued four months longer as Chief Resident Physician.

He expected to study surgery in Germany, but so many opportunities as substitute or assistant presented themselves that he gave up the idea and started practice.

The same year that he finished his internship, he was appointed Surgical Assistant to Dr. Edward Martin at both the University and Philadelphia General Hospitals. He also became Instructor in the Medical School of the University of Pennsylvania and from then until the time of his death was constantly connected with medical education.

He developed a large referred practise rather early in life. Part of this was probably due to his popularity as a football player, but his ability as a surgeon enabled him to steadily enlarge his clientèle for about twelve uneventful years. At that time he developed a low back-ache and was out of practise entirely for

* Read January 7, 1935.

about one year. Shortly after returning to practise, he was requested to complete the organization of the Base Hospital to represent the University of Pennsylvania Hospital. The work already done was less than about ten per cent complete. He again gave up most of his work for a year to raise the money, buy equipment and organize the personnel, consisting of 243 members. The equipment was the most extensive and contained more articles for the comfort of the personnel than that of most of the Units organized at that time.

Shortly after arriving in France, he was sent to the Front Line Service for instruction and was then attached to Mobile Hospital Number 2 from Presbyterian Hospital of New York and was with them until the Armistice was signed. He then returned to the Base Hospital in Chatel Guyon, France, and started getting things ready to take the Unit home. This was the first time that military appearance or discipline impressed him, and he earned for himself the title of "Father Dubbin." In the middle of 1919 he was relieved of military responsibilities, which had brought him work, praise, and criticism, a citation for bravery, a depleted bank account and impaired health.

During the War there was a change in the surgical department of the University Hospital, and Dr. Carnett was not reinstated on the staff. Shortly after this, he was offered a Professorship in Surgery in the Graduate School of Medicine and, several years later, he became Vice-Dean of Surgery in this School; both positions he held until his death. During these same years he was Surgeon to the Radiological Department of the Philadelphia General Hospital, where he taught both graduate and undergraduate students. A marked advance in our knowledge of metastases in cancer was made in the autopsy room at this Hospital, where Carnett and Handley met in 1925.

He started writing soon after starting practise, but due to the numerous interruptions in practise his list of articles is limited to fifty-one. An early paper on hernia of the cecum is still the best description and explanation of a sliding hernia that one can read. New York and Boston writers had monopolized the subject of subdeltoid bursitis. Dr. Carnett's writings on this subject have been most explicit and have put the therapy of the lesion on a much more rational basis.

His interest in recent years has been intercostal neuralgia.

His work in this field brought him much criticism and a curtailed income, but with his honesty of purpose he continued his studies along this line. In this work I feel that he has given a better explanation of operative failures and a truer reason for mistaken diagnosis than any yet attempted. This work, I feel, will later prove to be his real monument.

He is survived by his widow, Mrs. Alice Gemmell Carnett, and two children, John Berton Jr. and Alice Gemmell. He did not care for social activities and divided his time between his family and his profession. He belonged to most of the local organizations but did not care to belong to the national organizations.

His untimely death on July 29, 1934, at the Graduate Hospital, has been keenly felt by his many friends and associates. He has left his imprint of honest investigation on many of the younger men with whom he came in contact and he has left an inspiration of loyalty to all of us who knew his feeling for the University of Pennsylvania.

MEMOIR OF DR. WILLIAM CAMPBELL POSEY *

By WILLIAM ZENTMAYER, M.D.

In The Fall of 1892 there returned to the city of his birth, from his studies abroad, a young man richly endowed in mind and in mien, who was destined to play a distinguished part in American ophthalmology, Dr. William Campbell Posey.

Dr. Posey was born in the neighborhood of Twelfth and Arch streets, Philadelphia, July 5, 1866, the son of Dr. David Root Posey and Emily Jewell Campbell Posey. On his father's side he was a descendant of Francis Poschet of France, who migrated to England and from there came to America and settled in St. Mary's County, Maryland, in 1657. For many generations Dr. Posey's immediate paternal ancestors lived in Chester County, Pennsylvania. On his mother's side his ancestry was Scotch. The Campbell family have for many years lived in Philadelphia. In 1910 he married Hadassah Felton who, with three children, survives him.

His preparatory education was had in the Episcopal Academy, Philadelphia. From there he entered the College Department of the University of Pennsylvania, receiving the degree of A.B. in 1886. He then matriculated in the Medical Department and received the degree of M.D. in 1889.

His popularity and the esteem in which he was held at College is attested by the many honors bestowed upon him by his classmates. He was Bowl Man, Business Manager of The Pennsylvanian, President of the Athletic Association, of the Intercollegiate Association, and of the Class Football Team. He was a member of the Phi Kappa Psi and of the Philomatrian Society. While a student in the Medical Department he was President of the Stillé Society, and upon graduating received the Anomaly Prize.

He served his interneship at the Presbyterian Hospital and on its completion went abroad to study languages and ophthalmology. In pursuit of his studies he displayed an earnestness and oneness

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of purpose coupled with an intelligent application which was recognized and won for him the lasting friendship of his teachers, among whom were Collins, Hirschberg and Panas. He was particularly happy at Göttingen where he was a student during the winter of 1890–91, and he cherished a deep affection for his teachers and the kindly folk of that ancient seat of learning. In 1894, together with Smith, Marshall, Ford, Davis, Hoch and Kneas, he formed the Göttingen Society. He was the last living founder.

Soon after his return from abroad he conducted a most successful quiz in ophthalmology, as one of the Masters of the Medical Institute.

Having a host of friends and a wide circle of acquaintances Dr. Posey rapidly, one might say at once, acquired a large practice. In the course of a few years Dr. W. C. Swindells became associated with him in his office and remained with him until he retired from practice.

His clinics were well organized so that he could give most of his time to the ward cases and to operating. He was an alert clinician and worked rapidly.

As an operator Dr. Posey was skillful and resourceful and quick to adopt new methods. He was one of the first in this country to perform the Krönlein osteoplastic resection of the outer wall of the orbit and to put into practice the suggestion of Duane that tenotomy of the inferior oblique is indicated in the overaction of this muscle in paresis of the superior rectus of the opposite eye.

Dr. Posey had many hospital appointments. At the Wills, the Howard, and the Children's Hospitals he had active service, and was at various times visiting and consultant surgeon to the Wills, the Chestnut Hill, the Abington Memorial, the Norristown State, the Wernersville, and the Westerly (Rhode Island) Hospitals. He was for many years Professor of Ophthalmology at the Philadelphia Polyclinic and Hospital. During the War he served on the Draft Exemption Board.

He was a Fellow of the College of Physicians (and past chairman of its Section on Ophthalmology) and of the American College of Surgeons; a member of the State and County Medical Societies (and past chairman of the Section on Eye, Ear, Nose and Throat of the State Society) and of the American Medical Association (of which he was past chairman of the Section on Ophthalmology), of the American Ophthalmological Society (of which

he was past president), of the American Academy of Ophthalmology and Oto-Laryngology, and of the Ophthalmological Society of the United Kingdom; and served as a member of the Board of Directors of the National Society for the Prevention of Blindness.

He was a member of the University Club, the Merion Cricket Club and the Radnor Hunt Club.

As Chairman of the Section on Ophthalmology of the American Medical Association, 1909–10, Dr. Posey suggested to the Executive Committee of the Section the establishment of a fund to be known as the Herman Knapp Testimonial Fund. The purpose of the fund is to further the progress of ophthalmology and to honor one of the foremost ophthalmologists of the world. The fund is still active.

His address as Chairman was upon "The Visual Requirements in the Public Service of the United States." Only a perusal of this report can convey the thoroughness of his investigations, including as it does a study of the visual standards in force by our own government and those of Great Britain and Germany. Characteristically he states: "Anticipating some action by the Section I have already done what I could to establish better standards."

As Chairman of the first State Committee on Conservation of Vision he planned a comprehensive campaign for the prevention and treatment of ophthalmia neonatorum, enlisting the cooperation of ophthalmologists throughout the State.

He early became a contributor to the literature and published in all upwards of one hundred and thirty articles, principally clinical and covering practically all phases of ocular disorders.

Of these contributions four are of outstanding merit: "The Treatment of Chronic Simple Glaucoma by Miotics"; "The Ocular Symptoms of Affections of the Accessory Sinuses of the Nose"; "Vernal Conjunctivitis"; and "Congenital Squint."

We need speak here only of his advocacy of the more general use of miotics in the treatment of chronic simple glaucoma. It took courage, when all about him were urging early resort to operation, to advocate a mode of treatment of which a famous ophthalmologist had said that it did more harm than good because it deferred the inevitable operation to a stage of the disease when conditions were no longer favorable for its performance. Dr. Posey's contention was supported by the results obtained with mi-

otics in a large number of patients whose vision and field had been well maintained over a long period of time. Who is there that can speak with authority and certainty, by presenting stronger proof of the efficacy of operative procedures, and say that he was wrong?

It was in the masterly paper on congenital squint, in which he gives the histories of seventy cases, that he reports on the performance of tenotomy of the inferior oblique to correct the upshoot of the eye in adduction.

He edited and wrote the following books:

"A Treatise on Diseases of the Eye."—This was volume one of a treatise on diseases of the eye, nose, throat, and ear, edited by W. C. Posey and Johnathan Wright in 1903. The various chapters were written by men who had previously demonstrated their special ability in connection with the subject assigned. Dr. Posey wrote the chapter on "Examination of the Eye."

"The Eye and Nervous System. Their Diagnostic Relation." By Various Authors. Edited by W. C. Posey and W. G. Spiller. 1906.—Dr. Posey contributed the chapters on "Exophthalmic Goitre" and on "The Psychologic Effects of Operations on the Eyes."

"The Wills Hospital of Philadelphia. The influence of European and British ophthalmology upon it and the part it played in the last hundred years in developing ophthalmology in America." By W. C. Posey and Samuel Horton Brown. 1931.—This book, which was published in commemoration of the one hundredth anniversary of the founding of the Wills Hospital, was on the part of Dr. Posey truly a labor of love. Although he had severed his active relations with the hospital in 1919, his interest in it remained unabated until his end. The scope of the book is comprehensive and is much more than its title conveys. It includes a survey of the development of ophthalmology as a specialty, a concise and critical biographical sketch of all the surgeons who had served Wills and were no longer living, a bibliography of the members of the Staff and a history of the pioneer opticians of Philadelphia, and much other related matter.

"Hygiene of the Eye." By W. C. Posey. 1918.

Text books are ephemeral so that of the several volumes with which Dr. Posey's name is associated the history of the Wills Hospital will longest endure.

Because of essential hypertension, in 1919, Dr. Posey was obliged to curtail his work and resigned from his hospital and teaching positions and in 1926, following obstruction to the superior temporal vein of the retina of the left eye, he retired from active practice.

For a man of whom it might be said, as was said of another, "the sixteen hours' day, the pride of overwork, had been his life," this sudden letting down might have led to despondency, but Dr. Posey met it with a brave spirit and with fortitude and at once interested himself in other pursuits and with former associations in a less strenuous way; so that this period of his life was none the less productive. He engaged actively in welfare, committee and literary work. The history of the Wills Hospital, and the history of the Göttingen Society, and several memoirs belong to this period. During this time he also served as President of the American Ophthalmological Society and later as Councilor. He attended regularly the meetings of the National Society for the Prevention of Blindness, in New York, and took an active part in forming anew the State Committee on Conservation of Vision and was Chairman of the Philadelphia County Branch of this Committee. Also his family affairs demanded much of his time.

Soon after his marriage Dr. Posey made his home in Radnor, where he loved to entertain his more intimate friends.

In his younger days he usually spent his summers in the Engadine and Tyrolean Alps where, with his friend Dr. Paul Van Dyke of Princeton University, he enjoyed mountain climbing and tramping. In his middle years his summers were spent at his home at Watch Hill.

Dr. Posey was a lover of music, especially orchestral. At home he found further musical enjoyment in the accomplished piano performances of his wife.

He was an excellent judge of men and their aims and was outspoken in criticism or generous in praise as the case warranted. He had a friendly, sociable nature, and a genial wit enlivened his conversation. He possessed a forceful and compelling personality and rarely failed to accomplish his end, which fortunately was always for the best interests of medicine. He was a splendid organizer, and a committee of which he was chairman was certain to attain its object in the shortest possible time and with the utmost thoroughness, and the report usually reflected the chairman's viewpoint.

He was most generous and gave largely to the many charities with which he was connected.

He worshipped in the Presbyterian Church, in the mission work of which his mother was most active.

Dr. Posey's outstanding attributes were forcefulness, geniality, frankness, loyalty, generosity and magnanimity. His accomplishments were a clinician of keenness, a surgeon of skill and judgment, an author of distinction and an administrator of capability.

My earliest association with Dr. Posey was at the Wills Hospital, where he held the position of Assistant Surgeon in the service of C. A. Oliver (1893), I having a similar position in the service of W. F. Norris (1890). Soon after this, in 1895, we collaborated on our first paper, "A Study of 167 Cases of Chronic Glaucoma." We had the satisfaction not only of having this paper accepted by Dr. Herman Knapp, a most exacting and critical editor, but of receiving a congratulatory letter from him. After we both became Attending Surgeons it was rarely that either of us performed a difficult operation without the cooperation of the other. Our intimate friendship endured to the end.

His desire to share with his family the pleasure and profit of foreign travel caused him to overstep the bounds of prudence which his condition called for; and it was thus that he met with death, on September 5, 1934, at Naples, Italy, from a cerebral hemorrhage, as he was returning home with his family, whom he had shortly before joined.

Dr. Posey rests in the churchyard of Old St. David's, Radnor.

"Our lives are rivers, gliding free
To that unfathomed, boundless sea
The silent grave!"

THE ANNUAL ADDRESS OF THE PRESIDENT *

By ALFRED STENGEL, M.D.

Quite appropriately the Ordinances and By-Laws require the President at the January business meeting to make a report on the affairs of the College and, as the reports of the Secretary, Treasurer, and Council supply most of the material facts regarding the state of the College, some repetition may be unavoidable in a review of the activities of the College during the past year for the purpose of evaluating its work.

The scientific business should of course be uppermost in our minds as this was the prime purpose of the original establishment of the College. During its earliest years and down to a relatively recent period the meetings of the College were appropriately devoted to presentations by Fellows, and occasionally by invited guests, which were of more casual and ephemeral interest than has become a necessary feature of the papers offered in recent times. Throughout its history however it may well be said that the programs of the College furnished a fair cross-section of the current medical activities of the profession. As specialties in practice became established and as investigative medicine developed, it followed very naturally that more elaborate presentations took the place of brief papers and verbal communications, and at the same time there arose a necessity for establishing special Sections of the College for the discussion of topics relating to the several specialties. Some of these special Sections have been conspicuously successful in the number, variety and quality of the presentations and in the large attendance at the meetings, and all of them have served a useful purpose. It is, however, evident on reviewing the history of the past fifteen or twenty years that as the Sections grew stronger the College meetings seemed to have lost some of their appeal, even when thoroughly worthwhile programs were prepared. The causes for this are multiple. The chief reason no doubt was the fact that Fellows with specialized

* Read January 7, 1935.

interest found in the Section meetings what they desired, and were not attracted to the College meetings unless something in their own field was presented. A second reason may have been that under the old order the stated College meetings ended with "Private Business" before which non-members were asked to leave the hall. This necessarily created the impression, which has not been wholly eradicated, that non-members are not welcomed at the meetings. Every effort, and there have been many, to correct this impression has somewhat fallen short of accomplishing what seemed desirable. A third reason may have been that the programs of the College meetings have not been made with sufficient care.

During some years just passed earnest efforts have been made to correct these faults, and undoubtedly a better attendance at meetings indicates improvement in all respects. Fortunately, the College has received a number of generous endowments for lectures such as the F. D. Mütter, Mary Scott Newbold, Weir Mitchell, Nathan Hatfield and Anders Funds, and to an increasing extent these special lectures have been set for evenings of the stated meetings of the College. It would seem desirable to extend this plan so as to present one of the endowed lectures at each stated meeting. The highest type of medical work by persons throughout the country or by our own Fellows could in this way receive presentation, and by reason of the quality, novelty and general import of the lectures a larger number of our Fellows would be attracted to the meetings, and a large number of persons not members would attend.

It is evident that the fulfillment of such a program lays a heavy burden on the Scientific Business Committee, and that Fellows of the College should aid that Committee by making useful suggestions.

The scientific papers presented during the past year have been of uniform excellence, and the attendance at the meetings has been gratifyingly large. It is particularly agreeable to the President to refer to the fact that two of the lectures, given by Fellows of the College, the Mary Scott Newbold lecture on April 4, 1934, and by Dr. John B. Flick and the F. D. Mütter Lecture on December 5, 1934, by Dr. Charles H. Frazier, were conspicuous for their quality and for the original work on which they were based.

A departure in the traditions of the College was made on February 7, 1934, when instead of the stated meeting in the College Hall a joint meeting of the College and the American Academy of Political and Social Science was held at Irvine Auditorium, which was placed at the disposal of the two organizations by the University of Pennsylvania. The meeting was devoted to a discussion of various aspects of medical economics and was planned as far as possible to present divergent views. The speakers were all men of wide distinction, and the meeting attracted much attention locally and throughout the country.

The financial situation of the College has been the subject of discussion in a number of the Presidential Addresses in the past, and it could not of course be expected to be other than an anxious matter in these days of universal depression. During the past year study has been made by the Officers and Council to devise ways for economizing without injury to the work of the College and for increasing its revenue in all suitable ways. The property at 13th and Locust Streets continues to be the chief burden on account of the taxes exacted by the City and the poor return for rental due to the times. Even in this case some small relief has been lately obtained, and it is hoped that more may be accomplished during the coming year.

The invested funds of the College are in an exceptionally favorable condition. The defaults in payment on mortgages and bonds have been surprisingly small.

The expenses of maintaining the College and the Library necessarily remain heavy, but it is hoped that the careful attention now being given to this matter will bring about satisfactory results.

The affairs of the library under the Library Committee and our able Librarian have in many ways improved despite the increasing costs of books and journals, and thus far no curtailment in subscriptions has been necessary. Valuable additions have been made to the Library by individuals and especially by the group known as "Friends of the Library" recently established by Dr. Charles W. Burr. Additional members of this group are greatly needed, and it may not be impossible for some of our Fellows to induce persons interested in libraries but not members of the College to join.

A change in the manner of publishing the Transactions of

the College during the past year has been effective in producing decided economies and at the same time in improving the Transactions by incorporating in them brief abstracts of all of the presentations before the College and its Sections. Issued serially, the Transactions have in a considerable measure the character of a magazine and will have wider use than the yearly, bound publication of the past.

Notwithstanding financial stringency, several marked improvements have been made by the Hall Committee during the year. The repainting of Mitchell Hall, the better lighting of the Library and the acquisition of display cases for valuable books, medals and other objects should be mentioned.

Recently the Council has been giving earnest consideration to the finances of the College and is taking steps toward greater economies of operation.

During the year, 16 Fellows and 1 Honorary Fellow have died, and memoirs of two Fellows who died in the preceding year have been read.

Despite this heavy loss the total membership has increased by a total of seventeen.

The Council has met regularly and has transacted much important routine business. It has on several occasions at long meetings discussed the reports of a Committee appointed for the purpose of revising the Ordinances and By-Laws and was able to bring these considerations to a conclusion in time for presentation to the College tonight.

The Alvarenga Prize. The prize was awarded for 1934 to Professor Ernst Gellhorn, M.D., University of Illinois, Chicago, for his essay entitled "The Influence of Parathormone on the Neuromuscular System: An Experimental Analysis."

ANNUAL REPORT OF THE LIBRARY COMMITTEE FOR 1934

Mr. President: In accordance with the Ordinances and By-Laws of the College, I herewith submit the following report of the Library Committee for the year 1934:

Inventory

		1934	1933
Total number of volumes in the Library		174,822	173,021
Bound volumes, including 499 manuscripts	142,040		
Unbound Reports and Transactions	25,255		
Unbound Periodical "Reserves"	4,503		
Unbound volumes more or less incomplete	3,024		
	174,822		
Other unbound material		245,655	238,587
Pamphlets (less than 100 pages)	217,044		
Theses and Dissertations	28,611		
	245,655		
Duplicates		10,076	9,737
Portraits		29,385	27,206
Total of all items in the Library		459,938	448,551

Distribution of this Material

	Bound	Unbound	Total
General Library	147,923	307,818	455,741
On permanent deposit:			
Gross Library	3,783	4	3,787
Library of the Obstetrical Society of Philadelphia	217	0	217
Mütter Museum *	193	0	193
Total (including duplicates)	152,116	307,822	459,938

Current Periodicals

We have listed November 1, 1934, 1353 current periodical publications, including Transactions and Reports:

* The books of the Mütter Museum are not permitted to be removed from the College building.

	By Purchase	Exchange or Gratis	Total
1. American	146	368	514
2. Belgian	6	9	15
3. British	70	39	109
4. Canadian	4	6	10
5. Chinese	2	2	4
6. Cuban	0	8	8
7. Danish	7	1	8
8. Dutch	4	2	6
9. Finnish	2	5	7
10. French	130	23	153
11. German	229	16	245
12. Greek	0	3	3
13. Indian	2	6	8
14. Italian	74	22	96
15. Japanese	5	19	24
16. Mexican	0	11	11
17. Polish	0	7	7
18. Russian	2	5	7
19. South American	8	56	64
20. Spanish	6	10	16
21. Swedish	5	1	6
22. Swiss	3	1	4
23. Miscellaneous (Algerian, Czechoslovakian, Egyptian, etc.)	8	20	28
Totals 1934	694	659	1353
1933	719	672	1391

This total of 1353 includes 18 new titles added during the year; 4 by purchase, 14 in exchange or gratis. It does not include 90 titles of periodicals of which we have two or more numbers, but of which no 1934 issues have as yet been received. Though the numbers of various periodicals received during the year (12,906) was measurably increased over those of last year (7,866), the number of titles has decreased slightly. This may be attributed to the loss by death of a number of Fellows who had supplied us with their own copies of some of the less widely circulated periodicals and to the dropping by the Library of a number of similar ones. Nineteen periodicals which were previously being purchased are now being received in exchange.

Acquisitions and Accessions

During the year there were received from all sources 2129 volumes (including 242 unbound Reports and 389 duplicates); 6638 pamphlets; 2634 Theses and Dissertations; 12,906 numbers of various periodicals.

Unbound material and duplicates are not accessioned. The

accessions numbered 1498 volumes: Books, 850; Periodicals, 648 (by purchase, 765 volumes; by gift, 636 volumes; by exchange, 97 volumes).

Donations. The individual donors for the past year, ending November 1, 1934, number 315. The following gave twenty or more volumes: Dr. F. H. Adler, Dr. J. M. Deaver, Mrs. J. W. Eckfeldt, Dr. L. L. Frantz, Dr. A. Hand, Dr. B. C. Hirst, Mr. F. L. Hoffman, Dr. E. B. Krumbhaar, Miss J. M. McFadden.

Various publishing houses have presented volumes as follows: P. Blakiston's Son & Co., 1; F. A. Davis Co., 5; Lea and Febiger, 24; J. B. Lippincott Co., 11; W. B. Saunders Co., 40; Wodlinger Publisher, 1.

The Library is indebted for large gifts of pamphlets and unbound periodicals to the following donors: Dr. F. H. Adler, Dr. H. B. Allyn, Dr. J. H. Austin, Dr. E. J. G. Beardsley, Biological Abstracts, P. Blakiston's Son & Co., Dr. C. W. Burr, Dr. B. Chance, Dr. W. B. Davis, Dr. W. A. N. Dorland, Dr. A. A. Eshner, Mrs. G. Fetteroff, Dr. L. F. Flick, Dr. E. E. W. Given, Dr. J. P. C. Griffith, Dr. A. Hand, Dr. B. C. Hirst, Paul B. Hoeber, Inc., Dr. E. B. Krumbhaar, Dr. F. H. Leavitt, J. B. Lippincott Co., Medical Library Association (in exchange), Medical World, Dr. D. Riesman, W. B. Saunders Co., Dr. A. C. Sautter, Dr. G. E. deSchweinitz, University of Pennsylvania, Dr. J. Walsh, Dr. J. C. Wilson.

One hundred and ninety-two volumes were presented by the following authors or editors: R. Alsaker, R. N. Anderson, W. A. Evans, J. M. Andress, I. H. Goldberger, Miss R. Arkwright, D. T. Atkinson, T. W. Ayers, W. R. Aykroyd, Mrs. H. Babcock, Miss L. F. Bache, E. Baehr, F. H. Bartlett, C. G. Benedict, L. Berg, D. H. Bergey, H. Best, T. B. Beust, G. H. Bigelow, C. D. Blachy, W. B. Blanton, Miss C. Basset, F. G. Benedict, A. H. Bey, E. M. Bick, D. B. Blacklock, C. E. Blanchard, E. Bogen, J. C. Bond, N. O. Bourque, H. H. Bowen, L. J. Boyd, Miss N. Braddy, L. R. Broster, W. L. Brown, Sir J. C. Brown, F. Brush, W. H. Burnham, P. Butler, Sir E. W. Budge, W. A. Chapin, M. Chideckel, E. Clark, Miss M. W. Clarke, L. Clendening, S. S. Cohen, J. Collins, R. E. Corradini, G. G. Coulton, G. Crile, Miss H. B. Crutcher, E. P. Cumberbatch, A. H. Curtis, A. H. Douthwaite, F. D. Drewitt, J. C. Drummond, D. H. Duffie, W. H. Eddy, H. M. Evans, H. Fabing, J. Favill, M. N. Federspiel, P. Findley, M.

Fishbein, M. Fisher, G. S. Foster, J. F. Fulton, P. H. Futcher, L. Fox, J. Garland, E. N. Gathercoal, L. G. Goldbacher, N. G. Goodman, R. G. Gordon, M. Grant, Sir W. Grenfell, R. A. Gunn, M. T. Hanke, Miss M. E. Harding, W. H. Hay, R. Hernandez, A. E. Hertzler, D. M. Hestand, J. D. Hindley-Smith, L. E. Hinsie, J. M. Hiss, F. L. Hoffman, S. Horsley, C. Jackson, H. J. John, H. E. Jordon, A. D. Kaiser, Miss P. M. Kandel, F. E. Keller, H. Keller, J. H. Kellogg, Miss H. G. Kelly, Mrs. C. J. Kern, T. D. Kitchin, E. B. Krumbhaar, W. F. Kruse, R. D. Lawrence, R. M. LeComte, G. S. Lee, A. T. Legg, B. R. LeRoy, H. C. Loeffler, S. Lorand, W. E. Lower, W. S. Low, J. X. Loughran, M. Luckiesh, R. Maingot, F. H. Martin, O. Mausert, E. Mayo, C. E. Mayos, Miss K. C. Mead, S. V. Mead, L. M. S. Miner, A. Moore, D. T. V. Moore, W. N. MacArtney, Sir R. McCarrison, T. F. McNamara, T. B. Magath, Miss E. M. Merkley, G. F. McCleary, S. E. Massengill, A. Massey, Lord Moynihan, J. B. Nash, F. R. Nuzum, L. J. J. Nye, J. O'Brien, H. Ohara, T. J. Orbison, P. L. Parrish, F. G. Parsons, Miss E. C. Pearce, W. A. Pearson, R. Pemberton, Sir D'A. Power, G. K. Pratt, C. Ramus, W. Rankin, A. F. Reeve, W. J. Robinson, A. J. Rongy, F. A. Rotondaro, P. J. Rulon, O. Rudbeck, R. D. Rudolf, Miss G. C. Schwesinger, B. Sharp, G. C. Shattuck, M. H. Shutes, Sister Alma, E. M. Salmonsen, W. K. Sibley, J. G. Sigman, H. W. Soper, B. Spector, H. Spencer, E. C. Slagle, F. A. Stahl, Sir J. P. Stewart, E. P. Stibbe, H. R. Stiles, A. W. Stillians, Miss S. M. Stinchfield, E. T. Stuhr, H. G. Sutherland, E. Sydenstricker, J. A. Tobey, W. A. Troup, F. B. Turck, Sister Mary Victor, C. V. Vischer, E. G. Ullmann, A. W. Wakil, G. F. Walker, W. H. Welch, R. A. Willis, W. C. Wilkinson, R. C. Wingfield, C. E. A. Winslow, A. C. Woods, P. H. Woodnoth, W. B. Wolfe, Miss R. Wright, C. Xalabarder.

Six volumes were sent by the publishers at the request of the following authors or editors: C. M. Campbell, M. T. Harman, J. H. Leiner, F. H. Martin, J. R. Oliver, W. A. Pusey.

Exchanges

We have distributed books and journals on exchange account to one institution through the Medical Library Exchange, and have received thirty-two similar distributions.

2634 Theses and Dissertations have been received from the following European Schools of Medicine with which we exchange

publications at the present time: Universities of Amsterdam, Antioquia, Basel, Berlin, Bonn, Breslau, Erlangen, Giessen, Göttingen, Heidelberg, Kiel, Köln, Königsberg, Lausanne, Leiden, Leipzig, Liège, Lund, Marburg, Oslo, Paris, Rostock, Upsala, Utrecht, Würzburg.

It is of interest here to note, as a commentary on the European medical situation, that though the actual number of European Schools of Medicine with which we have exchanged publications during the year was increased by six, the number of Theses and Dissertations received was fewer by 1,269.

Readers' Use of the Library

The Library has been kept open two evenings each week and on the five minor legal holidays, as has been customary.

Number of readers:

	Visitors		Fellows		Total	
	1934	*1933*	*1934*	*1933*	*1934*	*1933*
Day	8,340	7,238	1,824	1,316	10,164	8,554
Evenings (75)	1,393	1,459	169	168	1,562	1,627
Legal Holidays (5)	145	200	23	28	168	228
	9,878	8,897	2,016	1,512	11,894	10,409

Circulation of books:

	1934	*1933*
Number of volumes taken out	8,298	5,189
Number of volumes consulted in the Library	47,134	47,130

The number of books "consulted in the Library" includes only those supplied on demand. Readers have access to the bound volumes of periodicals and works of reference kept on the shelves in the Reading Room, and the Fellows of the College have access to the book stacks. There are, therefore, many volumes consulted of which no accurate record can be kept.

The experiment of extending the Library's hours of functioning to six o'clock, and on Wednesdays and Fridays until ten o'clock, has more than justified itself. This extended service has so far involved no addition to the budget. A further extension of the hours, which would seem to be desirable and inevitable, owing to the unique service which this Library is able to offer the medical profession in the city, would involve such an addition, and to this problem we shall have to give some attention in the future. It will be seen that the attendance of both Fellows and

visitors has shown a gratifying increase over that of the preceding year.

Use of Study Rooms:

Average number of rooms in use throughout the year, 7.
Number of volumes used in these rooms during the year, 1823.

In the late spring the Library Committee promulgated a new set of rules governing the use of the study rooms, which for the past few years had largely been unoccupied. Under the new conditions, a Fellow is entitled to the use of a room free of charge for three days within a period of two weeks, thereafter paying twenty-five cents a day. An immediate consequence was that throughout the summer for the greater part of the time every room was in use.

Work of the Cataloguers

Number of works classified, shelf-listed, and for which cards were filed	824
Cards typewritten, examined, and filed	6141
Library of Congress and other cards altered and filed	3677
Pamphlets and reprints subject-headed and arranged alphabetically by subject, and by author under the subject	2639

An account of stock has been taken and any displacements found, arranged in their proper order.

Work was commenced on the compilation of special indexes of early presses, of printers' devices, and of important first editions represented in the library: the collection of medical book-plates was, furthermore, revised and brought up to date.

Acquisitions of Incunabula and Other Works of Special Interest

[Where the name of a donor is not specified, it may be assumed that the book was purchased from the Library's Fund for Rare Books. A double asterisk signifies that the title, a single asterisk that the edition, is not listed in the Index Catalogue.]

Incunabula

**Eusebius. Chronicon. [Translated by St. Jerome and continued by him, and by Prosperus Britannicus and Matthaeus Palmerius.] Venice, E. Ratdolt, 1483. Hain 6717.

Gift of Charles W. Burr, M.D.

This epitome of universal history in tabular form, by the famous author of the "History of the Christian Church," contains references to Hip-

pocrates and Galen and to the Athenian plagues. The book, in an unusually fine state of preservation, is a beautiful specimen of Ratdolt's color printing, an art which he was the second to master.

**Paulus Venetus. Expositio in Analytica Posteriora Aristotelis. Venice, Guil. Anima Mia, 1486. Hain 12512.

This marks the twenty-ninth volume of commentary (the third by Paulus Venetus) on Aristotle in our list of incunabula.

Other Works of Special Interest

*Almosnino [Moses ben Barach]. Regimiento de la vida. Salonica, Jaabez, 1564. *Gift of Charles W. Burr, M.D.*

This is a major work of the celebrated Jewish scientist, physician and philosopher. It is written in the Spanish-Hebrew dialect and contains several chapters on the etiology and interpretation of dreams.

*Antidotario romano, latino e volgare. Tradotto da Ippolito Ceccarelli *** con l'aggiunta dell' elettione de semplici, e prattica della compositione; e due trattati, uno de la Teriaca Romana,*** l'altro de la Teriaca Egittia [by Prosperus Alpinus]. Rome, G. A. Ruffinelli, 1624.

This little known work was the official pharmacopoeia of the College of Physicians at Rome. The original latin version was dedicated (the dedication is reprinted in this book) to Pope Gregory XIII, who died in 1585. Lipenius notices a 1590 Venetian edition of an *Antidotarium Romanum* and another edition at Frankfort in 1624, the same year in which this book was published. The dedication of this translation is dated 1611, implying an earlier printing than this. The Index Catalogue lists a later, enlarged edition, Rome, 1639.

Ballonius, G. Consiliorum medicinalium libri II. Paris, J. Quesnel, 1635–36.

Ballonius is credited with being the first to describe whooping-cough and to introduce the term rheumatism. This is his first published work. The Library lacks now of his works only the *Adversaria medicinalia.*

Bauhinus, C. Anatomes. vol. 1. Basel, S. Henricpetri, 1591.

Bell, C. W. Two lectures on cholera and intermittent fever. London, J. Churchill, 1849. *In Exchange.*

Borgarucci, P. De peste perbrevis tractatus. Venice, Marcus de Maria, 1565.

The Library has the *Chirurgia magna* attributed to Vesalius and published by Borgarucci, which is now known to be spurious. We do not have Borgarucci's most important work, *Della contemplazione anatomia* ***, in which he points out certain errors of Vesalius, Valverde and others of the Olympians.

van den Bosch, I. J. Historia constitutionis epidemicae verminosae, quae Annis 1760, 1761, 1762 & initio 1763 per insulam

Overflacqué *** grassata fuit. Leyden, S. & J. Luchtmans, 1769.

The author is credited with forecasting herein the germ theory, by ascribing the cause of disease to animate contagion.

**Cangemius, Fr. Franciscus, de Terranova. Brevisampla methodus pro morbis humani corporis in particulari curandis secundum recentiorum usum. Rome, A. Bernabò, 1658.

A manual compiled by an Augustinian Friar for his brothers. "You will not wonder, I think," says Brother Franciscus to his medical reader, "at me, an Anchorite,*** presenting myself to you as a colleague under Hippocrates, no less a master, if you will not think it incongruous that a holy man, a physician of the soul, should consort well with a physician of the body, and, in his cell, be not at odds with Galen." Hippocrates and Galen are drawn upon almost exclusively.

*Cockburn, Wm. Oeconomia corporis animalis. London, F. Leach, 1695.

The first published work of the picturesque inventor of a famous remedy for the fluxes.

Cohen, S. S. When love passed by and other verses, including translations from Hebrew poets of the Middle Ages. Phila., Rosenbach, [cop. 1929]. *Gift of the author.*

Comparetti, A. Occursus medici de vaga aegritudine infirmitatis nervorum. Venice, typ. Francisci ex Nicolao Pezzana, 1780. *Gift of Charles W. Burr, M.D.*

Comparetti was a pupil and friend of Morgagni. The reputation which he won by the publication of this work resulted in his being called from Venice to the University of Padua, to assume the chair in the theory and practice of medicine. The book consists of eight cases of which the history is given and then the analysis. Comparetti wrote a number of works, none other of which is in this Library.

Cordus, Eur. Ain Regiment: wie man sich vor der newen Plage, der englische Schwaiss genannt, bewaren, und so man damit ergryffen wirt, darinn halten soll. Marpurg, n. pr., 1529.

A treatise on the sweating-sickness by the esteemed poet, physician and botanist.

**Cren, F. A. Tractatus physico-medicus de Americana lue, ac omnium tutissima curandi methodo mercurii sublimati corrosivi ope. Meleda, N. Capacius, 1762.

An account of the author's treatment of syphilis with mercury. The references to Astruc, Boerhaave, Wiseman, Mead and many others, including his professors at Vienna, indicate a thorough grounding in the best medical practice of his day. The book, a rather elaborate but handsome bit of printing, was published on the island of Meleda, off the Dalmatian coast.

Daran, J. Traité complet de la gonorrhée virulente des hommes et des femmes *** suivi d'un mémoire sur la construction & les avantages d'un nouvel instrument pour tirer l'urine de la vessie. Paris, Delaguette, 1756.

Daran was a celebrated 18th century surgeon and urologist, of somewhat dubious methods, who is said to have numbered Rousseau among his patients. This treatise follows Astruc in its major doctrine.

Dawson, W. R. A leechbook or collection of medical recipes of the fifteenth century. Transcribed and edited, with an introduction, notes and appendix by Warren R. Dawson. London, Macmillan, 1934. *Gift of Charles W. Burr, M.D.*

An important addition to the literature of Anglo-Saxon leechdom. Cockayne's earlier collection is in the Library, but Henslow's is not.

Dioscorides. Della materia medicinale. Tradotto per M. Marcantonio Montigiano da S. Gimignano *** in lingua fiorentina. Florence, [B. di Giunti] 1547.

Ferrerius, A. Vera medendi methodus. Castigationes practicae medicinae. Toulouse, P. du Puys, 1557.

Gift of Charles W. Burr, M.D.

Ferrier was an interesting medical child of fortune. Much of the fortune he owed to a gift for judicial astrology. He was for a time ordinary physician to Catherine de Medici. This copy bears the author's inscription of gift to G. Innocentio, surgeon of Toulouse, dated 1587, the year before his death. Also, it has the book-plate of Sir Robert Alexander Chermside, physician to the English embassy in Paris about 1825.

Galen. *De euchymia et cacochymia, seu de bonis malisque succis generandis. [Translated by J. G. Andernacus.] Adiectus est Psellij Commentarius de victus ratione. Paris, S. Colinaeus, 1530.

——. *Introductio seu medicus; de sectis ad medicinae candidatos opusculum. [Translated by J. G. Andernacus.] Paris, S. Colinaeus, 1528.

——. Liber de optima secta ad Thrasibulum; liber, nunquid tuenda sanitas ad medicum pertineat an ad vocatum gymnasticum, ad Thrasibulum. [Translated by Junius Paulus Crassus.] Venice, B. de Bindonibus, 1538.

Gift of the Friends of the Library.

*Ghirardelli, Lor. Il memorando contagio seguito in Bergamo l'anno 1630. Historia scritta d'ordine publico. Bergamo, frat. Rossi, 1681. *Gift of the Friends of the Library.*

[Gladwin, F., ed.] A dictionary of the religious ceremonies of the Eastern nations * to which is added, a medical vocabulary. Calcutta, Wm. Mackay, 1787.

Gift of Myer Solis Cohen, M.D.

*Haines, I. S. Catechism on chemistry, adapted to the course of lectures delivered in the University of Pennsylvania. Phila., J. G. Auner, 1835. *Gift of Horace E. Frick, Esq.*

Jackson, R. A treatise on the fevers of Jamaica, with some observations on the intermitting fevers of America. Phila., R. Campbell, 1795.

Josephus, Fl. Opera. Cologne, Euch. Cervicornus, 1524.

Our chief ancient source for the history of Hebrew medicine.

*Lacinius, J. Pretiosa margarita novella de thesauro, ac pretiosissimo philosophorum lapide. Venice, Aldus, 1546.

This is the first edition of one of the most famous collections of writings on the philosopher's stone, to which in the medieval and renaissance periods miraculous therapeutic qualities were attributed.

Leonicenus, Nic. Contra suarum translationum detractores apologia. Venice, Jac. Pentius, 1522.

Pliny's severest critic replies to his own detractors. The Library owns also of this writer a copy of the first edition (1492) of the book on the errors of Pliny and others, and of each of the two fifteenth century editions (1497) of the author's noted monograph on syphilis.

Leonus, D. Ars medendi. Bologna, J. Rossius, 1583.

Two manuals of medical practice were published by this practicing physician of Bologna. This is a first edition of the second work.

Lorry, A–C. De morbis cutaneis. Paris, P. G. Cavelier, 1777.

This renowned Parisian physician was also a scholar who had a passion for rendering to the ancients in medicine their due. In addition to collecting and publishing the Aphorisms of Hippocrates and Sanctorius, he helped popularize the works of the English Richard Mead and published, of his own work, a treatise on melancholy and an essay on the uses of foods. The Library, unfortunately, does not own a copy of either of these works. The present work, on diseases of the skin, is considered one of the finest works of all time in its field and ranks as the first modern dermatological textbook.

Molinius, Ant. De diversa hominum natura, prout a veteribus philosophis ex corporum speciebus reperta est, cognoscenda liber. Lyons, J. Tornaesius, 1549.

This is an early little work, ante-dating della Porta and Lavater, on the reading of the human character by means of physiognomy, culled, the author says, from three sources, Loxus, the physician, Aristotle, the philosopher, and Polemon, the orator. The interpretations of character are derived from the features cap-à-pied.

Montanus, J. B. Explicatio eorum, quae pertinent, tum ad qualitates simplicium medicamentorum, tum ad eorundem compositionem. Venice, B. Constantinus, 1555.

Della Monte, the author of this pharmaceutical treatise, a colleague and friend of Vesalius, was the first to give beside instruction at Padua (1545). His *Consilia* and others of his numerous works, most of them published posthumously, are in the Library.

Montuus, H. De activa medicinae scientia commentarii duo. Lyons, J. Tornaesius & G. Gazeius, 1557.

Montuus was a fairly prolific 16th century writer, most of whose works are in the Library. This is a dietetical work which deals also with the diseases of women and children and with what is called "cosmetic medicine," i.e., corpulency, falling out of the hair, etc.

Moses Ibn Ezra. Selected poems of ***. Translated by Solomon Solis Cohen ***. [Text in Hebrew and English.] Phila., Jewish publ. soc. of Am., 1934.

Gift of Solomon Solis Cohen, M.D.

Musitanus, C. Opera omnia, seu trutina medica, chirurgica, pharmaceutico-chymica, etc. 2 vols. Geneva, Cramer & Perachon, 1716.

This medical writer, of the chemical school, is perhaps most interesting for a work which this Library lacks, *De lue venerea*, published first at Naples in 1689, in which he attempts to prove the antiquity of the venereal disease by comparing the cases of his own practice with descriptions in Celsus, Galen and Avicenna.

Pantaleon, H. Prosopographia heroum atque illustrium virorum totius Germaniae. Basel, N. Brylinger, 1565–1566.

One of the chief claims to fame of this noted book of biographies is that it contains the first biography of Vesalius, published two years after his death, and the first portrait of him outside the editions of the *Fabrica*.

Picus, V. De fungorum creatione. Dardana, J. A. Acta ad *** Picum. Torino, J. M. Briolus, 1788.

A work which has important sections on the medical properties of mushrooms.

*Pisanelli, B. Trattato della natura de cibi et[sic] del bere. Lodi, V. Taietti, 1585.

A well known 16th century work on dietetics and cookery. The author was a Bolognese physician, a pupil of Aldrovandi, the "modern Pliny."

Poole, R. A. A journey from London, to France and Holland ***. 2 vols. London, 1742–44.

Dr. Poole, who sailed sometimes under the alias of Theophilus Philanthropos, was an interesting 18th century physician with private means, a penchant for travel, and a talent for acute observation. An earlier vol-

ume, "A physical vade-mecum" (1741), a copy of which is in the Library, has a notable description of St. Thomas's Hospital as it existed in the author's day. The present books, likewise, contain considerable observation on the hospitals and medical centers of Europe.

Röntgen, W. K. Eine neue Art von Strahlen. Würzburg, 1895–1896. *Gift of the Philadelphia Roentgen Ray Society.*

This is a set of the eight pamphlet issues, including the Editio princeps, of Roentgen's original publication on the Roentgen Ray.

*Regimen sanitatis Salernitanum. De conservanda bona valetudine. Antwerp, J. Withagius, 1562.

————. De conservanda bona valetudine *** cum Arnoldi Novicomensis *** enarrationibus *** impressis, & auctis per Joan. Curionem ***. Venice, P. Marinellus, 1587.

————. Schola salernitana, sive de conservanda valetudine *** autore Joanne de Mediolano hactenus ignoti. Rotterdam, A. Leers, 1649. *Gift of E. B. Krumbhaar, M.D.*

————. Schola salernitana, de valetudine tuenda opus *** commentariis Villanovani, Curionis, Orellii et Costansoni illustratum. Adiectae sunt animadversiones *** Renati Moreau. Paris, L. Billaine, 1672.

*————. La scuola salernitana dilucidata *** opera di Fulvio Gherli. Venice, G. Corona, 1733.
Gift of the Friends of the Library.

**Rubeus, Hier. De destillatione sive de stillatitiorum liquorum, qui ad medicinam faciunt, methodo, atque virebus. [4 ed.] Venice, J. B. Ciottus, 1604. *Gift of the Friends of the Library.*

Rubeus [or Rossi], 1539–1607, of Ravenna, published also annotations on Celsus and a book on melons, neither of which is represented in this Library.

**Scaramucci, G. B. De motu, et circuitu sanguinis tractatus iatrophisicus. Fermo, A. de Montibus, 1677.

This is one of the many similar treatises to follow Harvey's work. The author maintains that the veins are supplied with blood by the contraction of the arteries.

*Servetus Villanovanus, M. Syruporum universa ratio, ad Galeni censuram diligenter expolita; cui, post integram de concoctione disceptationem, praescripta est vera purgandi methodus, cum expositione aphorismi: concocta medicari. Venice, off. Erasmiana, 1545.

Servetus' important contribution on the use of syrups, and on the Greek vs. Arabic doctrines of coction.

Stearns, S. An account of the terrible effects of the pestilential infection in the city of Philadelphia. With an elegy on the deaths of the people ***. Providence, Wm. Child, 1793.

This Samuel Stearns is presumably the public-spirited author of "The American herbal" and of "The mystery of animal magnetism." The pamphlet of eight pages contains the following verses:

The celebrated Dr. *Rush* did find,
That *calomel*, with *jalap* well combin'd,
Was the best *purge*, by far, that could be giv'n
By any *medicaster* under Heav'n.

*a Vega, Chr. Commentaria in librum aphorismorum Hippocratis. Venice, G. Perchacinus, 1571.

Gift of the Friends of the Library.

Vega was a celebrated Spanish writer on medicine, a professor of medicine, and physician to Don Carlos to whom this book is dedicated.

Manuscripts

Johannes Catanensis. Ars medica. [1738.]

Gift of the Friends of the Library.

Joannes is reputed to have lived at Catania, 1690–1753. This ancient Sicilian town was noted for its salubrious climate, which the town capitalized by setting itself up as a center of the art of healing. The book of 573 pages, dated at the end, "February, 1738," is divided into three parts, treating of: (1) Physiology, including Anatomy; (2) Semeiology; (3) Hygiene. It is a student's record of the master's lectures. Joannes seems to have had no printed publication.

————. Repertorium omnium medicaminum morbis omnibus specificorum curandis ***. [After 1733.]

Gift of the Friends of the Library.

This is a like record of Joannes' learning and teachings in pharmacology. There is appended what is apparently an excerpt from the treatise, *De signaturis internis rerum*, by that ardent Paracelsist, Oswald Croll.

Haggard, H. W. What a frail Sunday-school teacher did for medicine and humanity. [Typewritten manuscript.] 1933.

Gift of the author.

Dr. Haggard's paper on Dorothea Dix, read before the Section on Medical History of the College of Physicians and the Philadelphia Psychiatric Society, November 13th, 1933.

Mitchel[l], [J.] Dr. Mitchel[l]'s letter on the yellow fever. [Urbana, 1748.]

Gift of the late John Cadwalader and the Cadwalader family, through Francis R. Packard, M.D.

Benjamin Rush, in his account of the yellow fever in 1793, states that this manuscript had been put into his hands by Benjamin Franklin, and to following its observations he attributed much of his own success in the treatment of yellow fever in Philadelphia. In the words of Dr.

Packard, it is a manuscript "of prime importance in the history of American medicine *** valuable because of its authorship, its association with Benjamin Franklin and as a source of inspiration to Benjamin Rush."

Rogers, Theophilus. Book [of recipes, prescriptions, etc.] Norwich, Conn., 1779–1801.

Gift of Mrs. Howland Wood, through Russell Richardson, M.D.

Dr. Rogers was born in 1731 and died in 1801, the year of the last entry in the little book. The tradition about the book is that it was prepared by Dr. Rogers for his daughter Elizabeth, Mrs. Elihu Marvin, for use in emergencies when the doctor was away; but the character of some of the entries suggests that it enjoyed a wider use.

Westcott, T. S. A case of acetanilid poisoning in an infant. [Phila., 1897.] *Gift of Mrs. T. S. Westcott.*

Summary of Expenditures from the Funds

(The list of expenditures represents sums paid for current periodicals as well as for bound volumes; periodicals are not entered under "Volumes Purchased" until they are bound and accessioned.)

Endowed Library Funds	Volumes Purchased	Cost
Henrietta Rush Fales Baker Fund	30	$ 236.76
Luther S. Bent Fund	6	24.58
William T. Carter Fund	4	00.00
Gerardus Clarkson Fund	12	37.00
Francis X. Dercum Fund	7	205.90
Louis A. Duhring Book Fund	11	134.83
Augustus A. Eshner Fund	15	170.47
John D. Griscom Fund	27	140.92
Richard H. Harte Fund	21	257.81
Charles T. Hunter Fund	2	11.04
William F. Jenks Fund	32	327.69
Oliver A. Judson Fund	7	45.73
William V. and John M. Keating Fund	9	31.23
William W. Keen Fund	18	197.58
Library Endowment Fund	53	549.96
Horace Magee Memorial Fund	36	429.28
J. Ewing Mears Fund	15	242.53
Charles K. Mills Fund	2	11.29
Weir Mitchell Fund	22	230.57
E. E. Montgomery Fund	9	138.89
John H. Musser Fund	4	10.78
Elizabeth K. Newcomet Fund	10	35.96
William F. Norris Fund	19	173.99
Charles A. Oliver Fund	6	148.73
Philadelphia Medical Society Fund	8	18.01
Lewis Rodman Fund	19	152.03
Douglas Stockton Warren Fund	11	153.60
John F. Weightman Fund	7	50.25
J. William White Fund	26	229.92
Caspar Wistar Fund	21	173.80
S. Lewis Ziegler Fund	12	305.59
	481	$4,876.72

The total of expenditures includes also 69 volumes, to each of which two or more of the following funds contributed: Baker, Bert, Carter, Clarkson, Dercum, Duhring, Eshner, General Account, Harte, Jenks, Judson, Keen, Leffmann, Library Endowment, Mears, Mills, Mitchell, Montgomery, Newcomet, Norris, Oliver, Roman, Warren, Weightman, White, Wistar, Wood	69	
From the General Account	95	7,996.61
From Special Accounts:		
Friends of the Library	8	5.60
Fund for rare and valuable books	43	300.78
Fund for completing files of journals	66	66.15
Henry Leffmann Trust	0	338.70
Petty Cash Account	1	40.00
Photostat Fund	3	169.20
Special Fund for Binding Dissertations	0	43.00
George B. Wood Fund	14	365.57
	135	$1,329.00
Total volumes purchased	780	

(In 1933: 1,353 volumes were purchased; in 1932: 1,517 volumes.)

Expenditures from the Duhring Library Fund	$9,317.31
Expenditures from the Morris Longstreth Fund	705.73

Miscellaneous

Binding: 551 volumes have been bound ..... $ 877.65

Photostats: 1,137 prints have been furnished to Fellows; 136 prints to other than Fellows; 2,456 prints to the Library. The latter include 4 volumes of incunabula (bringing the total of photostated incunabula to 306), portraits, copies of rare books on loan, etc. Sale of Duplicates amounted to: $125.08.

Fines: amounted to $193.00.

343 copies of the Transactions were sent as gifts or in exchange for 285 publications of other organizations.

Exhibits

The display of rare books and incunabula has been facilitated by the acquisition of four large cases harmoniously adapted to the furnishings of the Norris Room in which they are placed. In the late spring a survey of the entire collection of incunabula was instituted, and it is still in progress. During the convention of the Inter-State Post-Graduate Medical Assembly the survey was interrupted in order to exhibit books and other material dealing with the early days of medicine in this country. Other exhibits have been held from time to time in connection with the meetings of the various sections of the College and of other societies, notably that of the Bacteriologists in December.

Functional Improvements

The seating capacity of the Ashhurst Room was increased by the transference to it from the Norris Room of two tables and four chairs. Reflectors were installed along the north wall of the Ashhurst Room, and the units of light in the Norris Room were adjusted so as to be made to function individually, and on the spot, instead of in groups from switches in the corridor. Sadly needed repairs were made to the chairs in both rooms.

One of the problems of the Library Committee has been the inability, heretofore, to determine how much a book or bound periodical has been used.

This has been solved, as far as contemporary and future use is concerned, by adopting the common library practice of pasting in each book as it is accessioned, and in the old books as they are withdrawn, a slip to be stamped with the date on which the book is due. The practice has a further, economical advantage in that it eliminates the former necessity of sending each year many hundreds of postal cards carrying this information. A change has been made, also, in the type of call-slip used, considerably advancing, it is felt, the efficiency and the analysis of the service.

Study-rooms: Finding that the pre-depression scale of charges for the use of the study-rooms had been largely responsible for their falling into a state of desuetude, the Committee revised considerably the conditions governing their use. The response was immediate; freshened by new coats of paint, through the co-operation of the Hall Committee, the rooms once more are in active use.

The Librarian has during the year read papers before the D. Hayes Agnew Society of the University of Pennsylvania, the Medical Library Association, at its annual meeting in Baltimore, and the College's Section on Medical History. The paper for the latter included a translation of one of the College's incunabula, Johannes Mercurius' "Contra Pestem." The paper for the Medical Library Association was printed in the October, 1934, issue of its Bulletin. Following the meeting of the Association, the Librarian was appointed to serve on its Program Committee.

Extension of use: The Committee, carrying out the wishes of the Fellows of the College, have been active in extending the legitimate use of the resources of the Library wherever possible. The Deans of the various medical schools of the city, with the approval of the College, have sent lists of their properly qualified students, who are thereupon accorded reading privileges in the Library. The privilege of withdrawing books involves, necessarily, the presentation of a card signed by a Fellow of the College, but the various Deans and Members of the Faculties who are also Fellows of the College have co-operated both to protect the interests of the Library and, at the same time, to make its unique resources serve the development of medical science as fully as possible.

The Council of the College has likewise extended the privileges of the Library, as of the College meetings, to others interested in medical research. It is hoped that, by these means and others, the Library may continue to live a full life, and a good one.

E. B. Krumbhaar, M.D.,
Chairman.

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(Supplement to lists in Transactions, 1932, 3s, LIV, pp. vii, lxi)

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ALVARENGA PRIZE OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA

1932	Not awarded	
1933	Harry Shay, M.D., and J. Gershon-Cohen, M.D.	Philadelphia
1934	Ernst Gellhorn, M.D.	Chicago

NATHAN LEWIS HATFIELD PRIZE AND LECTURESHIP

1933	XII	Dr. Arturo Castiglioni	Padua

MARY SCOTT NEWBOLD LECTURES

March 23,	1933	XXIX	Burton J. Lee, M.D.	New York
May 3, 5,	1933	XXX	Ronald T. Grant, M.D., M.R.C.P.	London (Eng.)
Oct. 4,	1933	XXXI	Sir Andrew MacPhail, Kt., B.A., LL.D., M.R.C.S., O.B.E.	Montreal
April 4,	1934	XXXII	John B. Flick, M.D.	Philadelphia
Nov. 7,	1934	XXXIII	Walter B. Cannon, M.D.	Boston

MÜTTER LECTURES

1933	Arthur B. Duel, M.D.	New York
1934	Charles H. Frazier, M.D.	Philadelphia

WEIR MITCHELL ORATION

1934	S. W. Ranson, Ph.D., M.D.	Chicago

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1934	Wade H. Brown, M.D.	New York

FELLOWS

DECEMBER, 1934

* For degrees and titles see TRANS., 1932, LIV., xi.
‡ For degrees and titles see TRANS., 1933, I., No. 1, x.

ELECTED

1892. DR. ALEXANDER C. ABBOTT, 4016 Pine St., Phila.*

1934. DR. WILLIAM OSLER ABBOTT, A.B., M.D., Instructor in Medicine, Instructor in Pharmacology, Medical School, U. of P.; Assistant Ward Physician and Physician to the Gastro-Intestinal Section, Hospital of the U. of P. University Hospital, 36th and Spruce Sts., Phila.

1912. DR. WILLIAM H. F. ADDISON, Med. Laboratories, University of Pennsylvania, Phila.*

1926. DR. FRANCIS HEED ADLER, M.A., M.D., Surgeon, Wills Hospital; Associate in Physiology, Medical School, U. of P.; Associate in Ophthalmology, Graduate School of Medicine, U. of P. 313 S. 17th St., Phila.

1905. DR. LEWIS H. ADLER, JR., 313 S. 17th St., Phila.*

1914. DR. THOMAS G. AIKEN, Berwyn, Pa.*

1906. DR. FRANCIS OLCOTT ALLEN, JR., 2216 Walnut St., Phila.*

1932. DR. FREDERICK H. ALLEN, 1711 Fitzwater St., Phila.*

1896. DR. HERMAN B. ALLYN, 3910 Chestnut St., Phila.*

1933. DR. ROBERT S. ALSTON, 121 Walnut Lane, Phila.‡

1888. DR. JAMES M. ANDERS, 250 S. 17th St., Phila.*

1905. DR. BROOKE M. ANSPACH, 1827 Spruce St., Phila.*

1930. DR. KENNETH E. APPEL, Haverford, Pa.*

1905. DR. L. F. APPLEMAN, 308 S. 16th St., Phila.*

1922. DR. JOHN H. ARNETT, 2116 Pine St., Phila.*

1920. DR. G. MASON ASTLEY, 812 N. 63d St., Phila.*

1914. DR. J. HAROLD AUSTIN, Maloney Clinic, Univ. Pa., Phila.*

1906. DR. JAMES A. BABBITT, 1912 Spruce St., Phila.*

1910. DR. BENJAMIN F. BAER, JR., 1927 Spruce St., Phila.*

1916. DR. PERCIVAL L. BALENTINE, 407 Weightman Bldg., 1524 Chestnut St., Phila.*

1898. DR. TILGHMAN M. BALLIET, 3920 Sansom St., Phila.*

1934. Dr. Joseph Bank, M.D., Assistant Professor of Gastro-Enterology, Graduate School of Medicine, U. of P.; Department of Gastro-Enterology, Mt. Sinai Hospital. 2031 Pine St., Phila.

1911. Dr. Everett P. Barnard, 1820 S. Rittenhouse Sq., Phila.*

1932. Dr. Everett S. Barr, West Chester, Pa.*

1924. Dr. Henry J. Bartle, 1930 Chestnut St., Phila.*

1931. Dr. William Bates, 2029 Pine St., Phila.*

1932. Dr. Oscar V. Batson, 3502 Hamilton St., Phila.*

1921. Dr. Edward L. Bauer, 345 S. 19th St., Phila.*

1933. Dr. John T. Bauer, Pennsylvania Hospital, Phila.‡

1922. Dr. Henry C. Bazett, Haverford, Pa.*

1908. Dr. E. J. G. Beardsley, 1919 Spruce St., Phila.*

1930. Dr. Joseph T. Beardwood, Jr., A.B., M.D., Assistant Professor of Medicine, Graduate School of Medicine, U. of P.; Physician, Presbyterian Hospital; Physician-in-Chief, Department of Metabolic Diseases, Abington Memorial Hospital. Suite 402, 2031 Locust St., Phila.

1932. Dr. Charles A. Behney, 133 S. 36th St., Phila.*

1934. Dr. Moses Behrend, A.M., M.D., F.A.C.S., Attending Surgeon, Phila. General Hospital, Jewish Hospital and Mt. Sinai Hospital. 1738 Pine St., Phila.

1930. Dr. William Parks Belk, Times Medical Bldg., Ardmore, Pa.*

1923. Dr. David H. Bergey, 206 S. 53d St., Phila.*

1934. Dr. Sydney Geoffrey Biddle, M.D., Instructor in Psychiatry and Psychoanalysis, Graduate Hospital; Diplomat of National Board of Medical Examiners. 257 S. 16th St., Phila.

1918. Dr. Arthur E. Billings, 2020 Spruce St., Phila.*

1917. Dr. Joseph C. Birdsall, 4610 Spruce St., Phila.*

1933. Dr. Paul A. Bishop, Penna. Hospital, Phila.*

1908. Dr. P. Brooke Bland, 1621 Spruce St., Phila.*

1917. Dr. Frank B. Block, 1121 Medical Arts Bldg., Phila.*

1929. Dr. Harry L. Bockus, 250 S. 18th St., Phila.*

1928. Dr. Russell S. Boles, Rittenhouse Plaza, Phila.*

1923. Dr. Earl D. Bond, 707 Old Lancaster Road, Bryn Mawr, Pa.*

1911. Dr. Charles W. Bonney, 1117 Spruce St., Phila.*

1924. Dr. David J. Boon, 1532 N. 15th St., Phila.*

1931. Dr. Edward L. Bortz, 2021 W. Girard Ave., Phila.*
1921. Dr. Francis F. Borzell, 4940 Penn St., Phila.*
1928. Dr. Albert E. Bothe, 133 S. 36th St., Phila.*
1928. Dr. Frederick A. Bothe, 133 S. 36th St., Phila.*
1923. Dr. John O. Bower, 2008 Walnut St., Phila.*
1891. Dr. George M. Boyd, 1909 Spruce St., Phila.*
1907. Dr. Henry P. Boyer, 4602 Baltimore Ave., Phila.*
1925. Dr. Irvine M. Boykin, 922 Medical Arts Bldg., Phila.*
1929. Dr. Samuel Bradbury, 151 West Coulter St., Germantown, Phila.*
1907. Dr. William N. Bradley, 1725 Pine St., Phila.*
1921. Dr. John W. Bransfield, 2101 Spruce St., Phila.*
1903. Dr. Thomas F. Branson, Rosemont, Pa.*
1900. Dr. Ward Brinton, 1423 Spruce St., Phila.*
1917. Dr. Ralph S. Bromer, 629 Pembroke Road, Bryn Mawr, Pa.*
1932. Dr. Claude P. Brown, 1930 Chestnut St., Phila.*
1919. Dr. Henry P. Brown, Jr., 1930 Chestnut St., Phila.*
1916. Dr. Samuel H. Brown, 1930 Chestnut St., Phila.*
1887. Dr. Albert P. Brubaker, 3426 Powelton Ave., Phila.*
1930. Dr. Carl J. Bucher, The Westbury, 15th & Spruce Sts., Phila.*
1916. Dr. Albert C. Buckley, Friends Hospital, Frankford, Phila.*
1928. Dr. Verne G. Burden, The Warwick, 17th and Locust Sts., Phila.*
1927. Dr. Michael A. Burns, M.D., Professor of Neurology, Jefferson Medical College; Neurologist, Phila. General Hospital. N.E. Corner 20th and Chestnut Sts. Phila.
1906. Dr. Stillwell C. Burns, 1925 Spring Garden St., Phila.*
1892. Dr. Charles W. Burr, B.S., M.D., D.Sc., Emeritus Professor of Mental Diseases, U. of P.; Psychiatrist, Phila. General Hospital; Physician, Orthopaedic Hospital and Infirmary for Nervous Diseases. 1527 Pine St., Phila.
1906. Dr. Ralph Butler, 1930 Chestnut St., Phila.*
1934. Dr. B. Franklin Buzby, A.B., M.D., F.A.C.S., Orthopaedist, Cooper Hospital, Camden, and Burlington County Hospital, Mt. Holly, N. J.; Assistant Surgeon, Orthopaedic Hospital and Infirmary for Nervous Diseases, Phila. 414 Cooper St., Camden, N. J.

1907. Dr. Williams B. Cadwalader, 133 S. 36th St., Phila.*
1928. Dr. Edward H. Campbell, 2117 Chestnut St., Phila.*
1931. Dr. Abraham Cantarow, M.D., Associate in Medicine, Jefferson Medical College; Biochemist, Jefferson Hospital. 2033 Delancey St., Phila.
1931. Dr. Walter L. Cariss, 2043 Walnut St., Phila.*
1930. Dr. Chapin Carpenter, A.B., M.D., Attending Ophthalmologist, Bryn Mawr Hospital. 1930 Chestnut St., Phila.
1905. Dr. Herbert B. Carpenter, 1805 Spruce St., Phila.*
1926. Dr. Howard Childs Carpenter, 1805 Spruce St., Phila.*
1895. Dr. John T. Carpenter, 1930 Chestnut St., Phila.*
1917. Dr. John B. Carson, 1802 Pine St., Phila.*
1922. Dr. Eugene A. Case, Lansdowne, Pa.*
1933. Dr. W. Edward Chamberlain, Temple University Hospital, Phila.‡
1900. Dr. Burton Chance, 315 S. 15th St., Phila.*
1903. Dr. Walter Chrystie, Bryn Mawr, Pa.*
1929. Dr. Eliot R. Clark, 315 S. 41st St., Phila.*
1934. Dr. Jefferson Hamer Clark, A.B., M.D., F.A.C.P., Director of Laboratories, Phila. General Hospital; Associate in Pathology, Graduate School of Medicine, U. of P. 1417 W. Erie Ave., Phila.
1926. Dr. J. Alexander Clarke, 334 S. 21st St., Phila.*
1926. Dr. Louis H. Clerf, 126 S. 10th St., Phila.*
1910. Dr. J. Howard Cloud, 11 W. Montgomery Ave., Ardmore, Pa.*
1903. Dr. George Morrison Coates, A.B., M.D., Professor of Otolaryngology, School of Medicine, and Professor of Otorhinology, Graduate School of Medicine, U. of P.; Surgeon-in-Charge, Department of Otolaryngology, Presbyterian and Abington Memorial Hospitals; (See also *). 1721 Pine St., Phila.
1908. Dr. Charles A. E. Codman, S. E. Corner 42d and Spruce Sts., Phila.*
1922. Dr. Leon Solis-Cohen, 1923 Spruce St., Phila.*
1907. Dr. Myer Solis-Cohen, 2110 Spruce St., Phila.*
1888. Dr. S. Solis-Cohen, 1906 Walnut St., Phila.*
1920. Dr. Charles J. Cole, Elkins Park, Pa.*
1898. Dr. Stricker Coles, Bryn Mawr, Pa.*

1934. Dr. Robert Clinton Colgan, B.S., M.D., Assistant Otolaryngologist, University Hospital and Graduate Hospital. 5734 N. 5th St., Phila.

1934. Dr. Leon H. Collins, Jr., A.B., M.D., Associate in Medicine, School of Medicine, and Instructor in Medicine, School of Dentistry, U. of P.; Assistant Physician, University Hospital. 401 S. 50th St., Phila.

1930. Dr. David A. Cooper, 1520 Spruce St., Phila.*

1911. Dr. Walter S. Cornell, 21st and Vine Sts., Phila.*

1914. Dr. Edward F. Corson, 918 Medical Arts Bldg., Phila.*

1930. Dr. James E. Cottrell, 2031 Locust St., Phila.*

1924. Dr. Alfred Cowan, 1930 Chestnut St., Phila.*

1904. Dr. Frank A. Craig, Phipps Institute, 7th and Lombard Sts., Phila.*

1907. Dr. George S. Crampton, 2031 Locust St., Phila.*

1924. Dr. Baxter L. Crawford, Jefferson Hospital, 10th and Sansom Sts., Phila.*

1920. Dr. William J. Creighton, N. E. Cor. 20th and Chestnut Sts., Phila.*

1920. Dr. George H. Cross, Chester, Pa.*

1917. Dr. Sumner H. Cross, Jenkintown, Pa.*

1921. Dr. Edward T. Crossan, 5324 Wayne Ave., Phila.*

1904. Dr. John M. Cruice, 406 S. 22d St., Phila.*

1934. Dr. R. Philip Custer, M.D., Chief, Division of Pathology, Phila. General Hospital; Associate in Pathology, School of Medicine, U. of P. 4035 Chestnut St., Phila.

1887. Dr. Judson Daland, 317 S. 18th St., Phila.*

1919. Dr. John R. Davies, Jr., 302 S. 19th St., Phila.*

1896. Dr. Charles N. Davis, 1931 Spruce St., Phila.*

1916. Dr. Warren B. Davis, 135 S. 18th St., Phila.*

1900. Dr. Alexander H. Davisson, Rush Hospital, 33d St. and Lancaster Ave., Phila.*

1902. Dr. Howard Dehoney, 240 S. 13th St., Phila.*

1924. Dr. L. Waller Deichler, 1930 Chestnut St., Phila.*

1923. Dr. Perce De Long, N. E. Cor. 20th and Chestnut Sts., Phila.*

1928. Dr. A. Lovett Dewees, Times Medical Bldg., Ardmore, Pa.*

1908. Dr. Henry K. Dillard, Jr., 234 S. 20th St., Phila.*

1924. Dr. Edward S. Dillon, 1803 Pine St., Phila.*

1932. Dr. Henry Dintenfass, 1305 Spruce St., Phila.*
1920. Dr. John Diven, 326 S. 19th St., Phila.*
1920. Dr. Joseph C. Doane, 19th and Spruce Sts., Phila.*
1933. Dr. Joseph C. Donnelly, 2008 Walnut St., Phila.‡
1907. Dr. George M. Dorrance, 2101 Spruce St., Phila.*
1902. Dr. Robert N. Downs, Jr., 6008 Greene St., Phila.*
1933. Dr. T. McKean Downs, 6013 Greene St., Phila.*
1910. Dr. William Drayton, Jr., 407 S. 22d St., Phila.*
1911. Dr. Henry C. Earnshaw, Bryn Mawr, Pa.*
1930. Dr. John Eiman, Cynwyd, Pa.*
1911. Dr. Eldridge L. Eliason, 326 S. 19th St., Phila.*
1928. Dr. Richard T. Ellison, 815 Medical Arts Bldg., Phila.*
1904. Dr. Walter Gray Elmer, 1801 Pine St., Phila.*
1934. Dr. William C. Ely, B.S., M.D., Associate Obstetrician, Presbyterian and Pennsylvania Hospitals; Assistant Obstetrician and Gynecologist, Phila. General Hospital; Instructor in Obstetrics, School of Medicine, U. of P. 3912 Chestnut St., Phila.
1932. Dr. Gilson G. Engel, 1914 Pine St., Phila.*
1934. Dr. Louis D. Englerth, M.D., F.R.C.S. (Edin.), Surgeon, Frankford, St. Joseph's and Northeastern Hospitals; Consulting Surgeon, Grandview Hospital, Sellersville, Pa. 5030 Oxford Ave., Frankford, Phila.
1893. Dr. Augustus A. Eshner, 1019 Spruce St., Phila.*
1912. Dr. Curtis C. Eves, 1910 Spruce St., Phila.*
1922. Dr. David L. Farley, 1725 Pine St., Phila.*
1903. Dr. Clifford B. Farr, Bryn Mawr, Pa.*
1893. Dr. William W. Farr, 121 Maplewood Ave., Germantown, Phila.*
1930. Dr. John T. Farrell, Jr., 235 S. 15th St., Phila.*
1924. Dr. Alexander G. Fewell, 1924 Pine St., Phila.*
1907. Dr. Charles A. Fife, 2104 Spruce St., Phila.*
1884. Dr. Henry M. Fisher, Jenkintown, Pa.*
1910. Dr. John Monroe Fisher, 345 S. 19th St., Phila.*
1928. Dr. Thomas Fitz-Hugh, Jr., 2020 Locust St., Phila.*
1928. Dr. John B. Flick, 1608 Spruce St., Phila.*
1888. Dr. Lawrence F. Flick, 736 Pine St., Phila.*
1916. Dr. John R. Forst, 166 W. Coulter St., Germantown, Phila.*
1908. Dr. Collin Foulkrod, 3910 Chestnut St., Phila.*

1933. Dr. Kenneth Fowler, 51 N. 39th St., Phila.‡
1908. Dr. Herbert Fox, Haverford, Pa.*
1906. Dr. Frederick Fraley, Overbrook, Pa.*
1897. Dr. Charles H. Frazier, 3400 Spruce St., Phila.*
1933. Dr. James Scott Fritch, 269 S. 19th St., Phila.‡
1928. Dr. Daniel H. Fuller, 4401 Market St., Phila.*
1933. Dr. Clarence J. Gamble, 537 Allen's Lane, Phila.‡
1899. Dr. Robert G. Gamble, Haverford, Pa.*
1931. Dr. Vaughn C. Garner, Germantown Professional Building, Phila.*
1917. Dr. Arthur H. Gerhard, 1615 N. Delaware Ave., Phila.*
1902. Dr. Albert A. Ghriskey, 3936 Walnut St., Phila.*
1899. Dr. John H. Gibbon, 1608 Spruce St., Phila.*
1934. Dr. John H. Gibbon, Jr., A.B., M.D., Assistant Surgeon, Outpatient Department, Pennsylvania Hospital and Bryn Mawr Hospital; Assistant Demonstrator of Surgery, Jefferson Medical College. 1608 Spruce St., Phila.
1933. Dr. U. Grant Gifford, Kennett Square, Pa.*
1920. Dr. A. Bruce Gill, 1930 Chestnut St., Phila.*
1931. Dr. Robert Louis Gilman, M.Sc. (med.), M.D., Associate in Dermatological Research, U. of P.; Assistant Dermatologist, Phila. General Hospital; Dermatologist, St. Joseph's and Burlington County Hospitals. 1930 Chestnut St., Phila.
1927. Dr. William R. Gilmour, 1737 Chestnut St., Phila.*
1931. Dr. Anthony A. S. Giordano, 1819 S. Broad St., Phila.*
1897. Dr. John H. Girvin, 2120 Walnut St., Phila.*
1920. Dr. Thomas S. Githens, The Cambridge, Wissahickon and School Lane, Phila.*
1906. Dr. J. C. Gittings, 551 Maloney Clinic, 36th and Spruce Sts., Phila.*
1905. Dr. Ellis E. W. Given, 2714 Columbia Ave., Phila.*
1906. Dr. R. Max Goepp, 518 Medical Arts Bldg., Phila.*
1906. Dr. Harold G. von Goldberg, 2213 Walnut St., Phila.*
1933. Dr. Harold Leon Goldburgh, 1932 Spruce St., Phila.‡
1905. Dr. Alfred Gordon, 1812 Spruce St., Phila.*
1928. Dr. Burgess L. Gordon, 1832 Spruce St., Phila.*
1894. Dr. Edwin E. Graham, 1713 Spruce St., Phila.*
1926. Dr. Francis C. Grant, 3400 Spruce St., Phila.*
1904. Dr. Charles P. Grayson, 262 S. 15th St., Phila.*

1933. Dr. Sigmund S. Greenbaum, 1714 Pine St., Phila.‡
1910. Dr. Milton J. Greenman, Wistar Institute, 36th St. and Woodland Ave., Phila.*
1932. Dr. George C. Griffith, 3833 Walnut St., Phila.*
1883. Dr. J. P. Crozer Griffith, 1810 Spruce St., Phila.*
1934. Dr. John Q. Griffith, Jr., B.A., M.D., Instructor in Medicine and Henrietta Heckscher Fellow in Research Medicine, U. of P.; Visiting Physician, University Hospital. 214 Glencoe Ave., Upper Darby, Pa.
1912. Dr. J. Milton Griscom, 2213 Walnut St., Phila.*
1933. Dr. Charles Merl Michael Gruber, Jefferson Medical College, Phila.‡
1932. Dr. Jacques P. Guequierre, Room 806, 1930 Chestnut St., Phila.*
1894. Dr. S. McC. Hamill, 1822 Spruce St., Phila.*
1897. Dr. Alfred Hand, Jr., 1724 Pine St., Phila.*
1932. Dr. Stanley E. Harris, Lansdowne, Pa.*
1929. Dr. Francis G. Harrison, 1900 Spruce St., Phila.*
1933. Dr. William John Harrison, 135 S. 17th St., Phila‡
1903. Dr. Charles D. Hart, Chestnut Hill, Phila.*
1926. Dr. Fred L. Hartmann, 1914 Pine St., Phila.*
1932. Dr. J. Calvin Hartman, 100 W. Walnut Lane, Phila.*
1907. Dr. Charles J. Hatfield, Phipps Institute, 7th and Lombard Sts., Phila.*
1911. Dr. Charles R. Heed, 1205 Spruce St., Phila.*
1901. Dr. John C. Heisler, 3829 Walnut St., Phila.*
1903. Dr. J. Norman Henry, 1906 Spruce St., Phila.*
1927. Dr. Leon Herman, 801 Medical Arts Bldg., Phila.*
1891. Dr. Addinell Hewson, 257 S. 16th St., Phila.*
1924. Dr. William Hewson, 6013 Greene St., Phila.*
1888. Dr. Barton Cooke Hirst, 1821 Spruce St., Phila.*
1924. Dr. John C. Hirst, 2d, 1918 Pine St., Phila.*
1933. Dr. Lewis Haler Hitzrot, 1704 Pine St., Phila.‡
1905. Dr. E. B. Hodge, 2019 Spruce St., Phila.*
1931. Dr. H. Albert Holland, 8200 Crittenden St., Phila.*
1933. Dr. Irving W. Hollingshead, 123 S. 18th St., Phila.*
1932. Dr. I. Pemberton P. Hollingsworth, 33 S. High St., West Chester, Pa.*
1906. Dr. Thomas B. Holloway, 1819 Chestnut St., Phila.*
1919. Dr. Arthur H. Hopkins, 1726 Pine St., Phila.*

1925. Dr. R. Dale Hopkinson, Jenkintown, Pa.*
1928. Dr. Karl M. Houser, 2010 Spruce St., Phila.*
1908. Dr. Daniel M. Hoyt, The Tracy, 36th and Chestnut Sts., Phila.*
1892. Dr. William E. Hughes, 3945 Chestnut St., Phila.*
1923. Dr. John E. Hume, N. E. Corner 20th and Chestnut Sts., Phila.*
1921. Dr. Robert J. Hunter, 2011 Chestnut St., Phila.*
1926. Dr. David N. Husik, 1930 Chestnut St., Phila.*
1934. Dr. Frank H. Hustead, M.D., 1930 Chestnut St., Phila.
1898. Dr. J. P. Hutchinson, Media, Pa.*
1921. Dr. Robert H. Ivy, 1930 Chestnut St., Phila.*
1917. Dr. Chevalier Jackson, 3432 N. Broad St., Phila.*
1932. Dr. Chevalier Lawrence Jackson, 3432 N. Broad St., Phila.*
1934. Dr. Maurice S. Jacobs, B.S., M.D., Associate in Medicine, Temple University; Associate Cardiologist, Jewish Hospital; Associate in Medicine, Jewish Hospital. 1922 Spruce St., Phila.
1922. Dr. Howard L. Jameson, 2133 S. 16th St., Phila.*
1913. Dr. William H. Jefferys, Rosemont, Pa.*
1930. Dr. Paul N. Jepson, 1824 Spruce St., Phila.*
1928. Dr. Rutherford L. John, 256 S. 21st St., Phila.*
1926. Dr. George Ernest Johnson, 5341 Chester Ave., Phila.*
1918. Dr. Leon Jonas, 255 S. 17th St., Phila.*
1924. Dr. Harold W. Jones, Room 901, 1930 Chestnut St., Phila.*
1913. Dr. John F. X. Jones, 2056 N. 63d St., Phila.*
1900. Dr. Charles F. Judson, 1005 Spruce St., Phila.*
1902. Dr. Henry D. Jump, 2019 Walnut St., Phila.*
1903. Dr. F. J. Kalteyer, 1530 Locust St., Phila.*
1926. Dr. Isadore Kaufman, 1616 Walnut St., Phila.*
1923. Dr. James Kay, 600 W. Olney Ave., Phila.*
1912. Dr. Floyd E. Keene, 133 S. 36th St., Phila.*
1913. Dr. Francis J. Kelly, 2211 Locust St., Phila.*
1932. Dr. Herbert T. Kelly, 1900 Spruce St., Phila.*
1909. Dr. James A. Kelly, 1815 Spruce St., Phila.*
1912. Dr. Thomas C. Kelly, 105 School Lane, Phila.*
1898. Dr. A. F. Kempton, 2118 Pine St., Phila.*
1905. Dr. Delno E. Kercher, 1534 Pine St., Phila.*
1921. Dr. Richard A. Kern, University Hospital, 36th and Spruce Sts., Phila.*

1930. Dr. Robert A. Kimbrough, Jr., 255 S. 17th St., Phila.*
1931. Dr. Willard H. Kinney, 315 S. 17th St., Phila.*
1920. Dr. Joseph V. Klauder, 1934 Spruce St., Phila.*
1920. Dr. Thomas Klein, 250 S. 18th St., Phila.*
1934. Dr. Roland N. Klemmer, A.B., M.D., F.A.C.P., Chief of Staff, and Cardiologist, Lancaster General Hospital. 439 N. Duke St., Lancaster, Pa.
1934. Dr. Oram R. Kline, M.D., F.A.C.S., Otolaryngologist, Pennsylvania Hospital, Phila., Cooper Hospital, Camden, and Burlington County Hospital, Mt. Holly, N. J. 414 Cooper St., Camden, N. J.
1913. Dr. Edward J. Klopp, 1611 Spruce St., Phila.*
1932. Dr. John W. Klopp, 618 W. Lehigh Ave., Phila.*
1919. Dr. Norman L. Knipe, 1930 Chestnut St., Phila.*
1908. Dr. Frank C. Knowles, 2035 Spruce St., Phila.*
1925. Dr. Harry E. Knox, 719 66th Ave., Oak Lane, Phila.*
1914. Dr. John A. Kolmer, Cynwyd, Pa.*
1932. Dr. Karl Kornblum, Wynnewood, Pa.*
1904. Dr. Frederick Krauss, Room 703, 1930 Chestnut St., Phila.*
1914. Dr. Edward B. Krumbhaar, Box 4310, Chestnut Hill, Phila.*
1900. Dr. Wilmer Krusen, Lansdowne, Pa.*
1932. Dr. Eugene M. Landis, University Hospital, 36th and Spruce Sts., Phila.*
1904. Dr. Henry R. M. Landis, Phipps Institute, 7th and Lombard Sts., Phila.*
1907. Dr. H. Maxwell Langdon, 1530 Locust St., Phila.*
1933. Dr. Roy L. Langdon, School and Gypsy Lanes, Phila.*
1934. Dr. Louis B. Laplace, A.B., M.D., Assistant Physician, Phila. General and Misericordia Hospitals; Cardiologist, St. Agnes Hospital. 1900 Rittenhouse Sq., Phila.
1926. Dr. George M. Laws, B.S., M.D., Gynecologist, Presbyterian Hospital; Gynecologist, American Hospital for Diseases of the Stomach; Assistant Professor of Gynecology, Graduate School of Medicine, U. of P. 1907 Spruce St., Phila.
1920. Dr. Frederic H. Leavitt, 1527 Pine St., Phila.*
1904. Dr. Theodore Le Boutillier, 1930 Chestnut St., Phila.*

1934. Dr. Thomas B. Lee, M.D., F.A.C.S., Gynecologist, Cooper Hospital, Camden; Zurbrugg Memorial Hospital and Salem Memorial Hospital (Consulting); Consulting Gynecologist, Bancroft School. 626 Cooper St., Camden, N. J.

1908. Dr. Walter E. Lee, 905 Pine St., Phila.*

1920. Dr. Simon S. Leopold, 2025 Spruce St., Phila.*

1933. Dr. J. Walter Levering, 1309 Oak Lane, Phila.‡

1915. Dr. Fielding O. Lewis, 259 S. 17th St., Phila.*

1904. Dr. Eugene Lindauer, 6451 N. Broad St., Phila.*

1927. Dr. Walter H. Lindsey, 810 W. Dauphin St., Phila.*

1907. Dr. Edward Lodholz, Medical Laboratories, University of Pa., Phila.*

1931. Dr. S. A. Loewenberg, 1905 Spruce St., Phila.*

1934. Dr. C. N. Hugh Long, M.D.C.M., D.Sc. (Manchester), Director of George S. Cox Medical Research Institute, U. of P.; Assistant Professor of Medicine, U. of P. Maloney Clinic, 36th and Spruce Sts., Phila.

1933. Dr. Esmond Ray Long, Phipps Institute, 7th and Lombard Sts., Phila.‡

1893. Dr. Daniel Longaker, 1806 Spruce St., Phila.*

1931. Dr. Edwin P. Longaker, 1806 Spruce St., Phila.*

1921. Dr. Balduin H. E. Lucke, Medical School, University of Pa., Phila.*

1924. Dr. John B. Ludy, 1201 Medical Arts Bldg., Phila.*

1923. Dr. Charles W. Lueders, 1930 Chestnut St., Phila.*

1932. Dr. Francis D. W. Lukens, University Hospital, 36th and Spruce Sts., Phila.*

1930. Dr. Robert M. Lukens, M.D., Assistant Professor of Bronchoscopy and Esophagoscopy, Jefferson Medical College; Assistant Bronchoscopist, Jefferson and Jewish Hospitals; Laryngologist, Henry Phipps Institute. 1923 Spruce St., Phila.

1929. Dr. Clifford B. Lull, 1731 Pine St., Phila.*

1919. Dr. Frank B. Lynch, Jr., M.D., Director of Pathology, Germantown Dispensary and Hospital. Germantown Hospital, E. Wister St., Phila.

1914. Dr. B. B. Vincent Lyon, 2031 Locust St., Phila.*

1933. Dr. Leo F. McAndrews, 1930 Chestnut St., Phila.‡

1932. Dr. James F. McCahey, 1709 Pine St., Phila.*

1900. Dr. Daniel J. McCarthy, 2025 Walnut St., Phila.*

1931. Dr. Edward McCloskey, 7 E. Chestnut Ave., Chestnut Hill, Phila.*

1934. Dr. Grayson P. McCouch, A.B., M.D., Assistant Professor of Physiology, U. of P. Medical School, University of Pa., Phila.

1913. Dr. Thomas McCrae, 1929 Spruce St., Phila.*

1895. Dr. Joseph McFarland, 542 W. Hortter St., Germantown, Phila.*

1931. Dr. Joseph McIver, 133 S. 36th St., Phila.*

1905. Dr. R. Tait McKenzie, 2014 Pine St., Phila.*

1933. Dr. James S. McLaughlin, 334 S. 21st St., Phila.*

1924. Dr. Thomas M. McMillan, 2044 Locust St., Phila.*

1924. Dr. F. Maurice McPhedran, Phipps Institute, 7th and Lombard Sts., Phila.*

1932. Dr. Catharine Macfarlane, Medical Arts Bldg., Phila.*

1910. Dr. William H. Mackinney, 1930 Chestnut St., Phila.*

1914. Dr. F. Hurst Maier, 2019 Walnut St., Phila.*

1913. Dr. Willis F. Manges, 235 S. 15th St., Phila.*

1889. Dr. Edward Martin, 135 S. 18th St., Phila.*

1932. Dr. Richard Hardaway Meade, Jr., B.S., M.D., Associate in Surgery, U. of P.; Assistant Surgeon, University Hospital; Associate Surgeon, Episcopal Hospital; Consulting Surgeon, Home for Consumptives, Chestnut Hill. 200 W. Mermaid Lane, Phila.

1934. Dr. Paul M. Mecray, M.D., F.A.C.S., Chief Surgeon, President of Staff, Cooper Hospital, Camden; Surgeon, Zurbrugg Memorial Hospital, Riverside, N. J.; Surgeon, Salem Memorial Hospital; Consulting Surgeon, Underwood Hospital, Woodbury, N. J. 405 Cooper St., Camden, N. J.

1914. Dr. J. Bernhard Mencke, 1816 Spruce St., Phila.*

1923. Dr. Walter Mendelson, 639 Church Lane, Germantown, Phila.*

1914. Dr. William J. Merrill, 2017 Spruce St., Phila.*

1934. Dr. Hugh McC. Miller, Ph.B., M.D., Assistant Professor of Medicine and Visiting Physician, Graduate School of Medicine, U. of P.; Chief, Department of Internal Medicine, Wills Hospital. 1614 Locust St., Phila.

1932. Dr. M. Valentine Miller, B.S., M.D., Associate in Otology, Graduate School of Medicine, Instructor in Otolaryngology, Medical School, U. of P.; Otolaryngologist, Municipal Hospital for Contagious Diseases, Phila., and Memorial Hospital, Roxborough; Assistant Otolaryngologist, Graduate and University Hospitals. 114 W. Phil-Ellena St., Phila.

1921. Dr. T. Grier Miller, University Hospital, 36th and Spruce Sts., Phila.*

1904. Dr. Charles F. Mitchell, 2003 Pine St., Phila.*

1921. Dr. Henry K. Mohler, 319 S. 16th St., Phila.*

1932. Dr. Roy W. Mohler, 323 S. 20th St., Phila.*

1932. Dr. Thaddeus L. Montgomery, 1930 Chestnut St., Phila.*

1928. Dr. Virgil H. Moon, Jefferson Medical College, Phila.*

1923. Dr. William F. Moore, 255 S. 16th St., Phila.*

1924. Dr. Stirling W. Moorhead, 1523 Pine St., Phila.*

1918. Dr. Arthur C. Morgan, 1930 Chestnut St., Phila.*

1886. Dr. Caspar Morris, Haverford, Pa.*

1893. Dr. Elliston J. Morris, 128 S. 18th St., Phila.*

1929. Dr. Stuart Mudd, Dept. Bacteriology, Univ. of Penna., Phila.*

1934. Dr. Edward A. Mullen, M.D., Assistant Professor of Urology, Graduate School of Medicine, U. of P.; Assistant Professor of Pharmacology and Physiology, Phila. College of Pharmacy and Science; Attending Surgeon, Genito-Urinary Dept., Phila. General Hospital; Assistant Urologist, Graduate Hospital; Urologist, Memorial Hospital, St. Christopher's Hospital for Children and National Stomach Hospital. 2615 W. Somerset St., Phila.

1905. Dr. George P. Müller, 1930 Spruce St., Phila.*

1930. Dr. Douglas P. Murphy, 4312 Pine St., Phila.*

1934. Dr. Eugene C. Murphy, M.D. Surgeon, St. Agnes Hospital; Attending Specialist in Surgery, U. S. Public Health Service. 1841 S. Broad St., Phila.

1905. Dr. Louis H. Mutschler, 1625 Spruce St., Phila.*

1902. Dr. Charles F. Nassau, 1710 Locust St., Phila.*

1887. Dr. Thomas R. Neilson, 1937 Chestnut St., Phila.*

1905. Dr. William S. Newcomet, 3501 Baring St., Phila.*

1905. Dr. Arthur Newlin, 1804 Pine St., Phila.*

1899. Dr. William Rufus Nicholson, A.B., M.D., Professor of

Gynecology, Graduate School of Medicine, U. of P.; Consultant Obstetrician, Presbyterian Hospital. 2023 Spruce St., Phila.

1889. Dr. Charles P. Noble, Radnor, Pa.*

1905. Dr. Charles C. Norris, 133 S. 36th St., Phila.*

1892. Dr. Richard C. Norris, 500 N. 20th St., Phila.*

1933. Dr. Josef B. Nylin, University Hospital, Phila.‡

1913. Dr. Alexander Hay O'Neal, St. Davids, Pa.*

1913. Dr. George W. Outerbridge, 1927 Spruce St., Phila.*

1915. Dr. Hubley R. Owen, 319 S. 16th St., Phila.*

1897. Dr. Francis R. Packard, 304 S. 19th St., Phila.*

1933. Dr. Harold Dean Palmer, 111 N. 49th St., Phila.‡

1906. Dr. Henry K. Pancoast, Grays Lane, Haverford, Pa.*

1909. Dr. Benjamin D. Parish, 1927 Spruce St., Phila.*

1899. Dr. William E. Parke, 1534 N. 15th St., Phila.*

1925. Dr. Clarence A. Patten, M.D., Neurologist, Phila. General Hospital, Lankenau Hospital, Wills Hospital and Delaware General Hospital. Suite 2703, 255 S. 17th St., Phila.

1910. Dr. Ross Vernet Patterson, M.D., ScD., Dean and Sutherland M. Prevost Professor of Therapeutics, Jefferson Medical College; Honorary Consulting Physician, Phila. General Hospital; Member of Advisory Health Board of Pennsylvania. 2126 Spruce St., Phila.

1931. Dr. John Davis Paul, 3112 N. Broad St., Phila.*

1932. Dr. Franklin L. Payne, 133 S. 36th St., Phila.*

1922. Dr. P. S. Pelouze, 1737 Chestnut St., Phila.*

1909. Dr. Ralph Pemberton, Paoli, Pa.*

1930. Dr. Eugene P. Pendergrass, Ardmore, Pa.*

1932. Dr. Howard Y. Pennell, West Chester, Pa.*

1914. Dr. O. H. Perry Pepper, M.D., Professor of Medicine, School of Medicine, U. of P. University Hospital, 36th and Spruce Sts., Phila.

1902. Dr. William Pepper, School of Medicine, University of Penna., Phila.*

1916. Dr. Milton F. Percival, 2332 S. Broad St., Phila.*

1917. Dr. Luther C. Peter, 1930 Chestnut St., Phila.*

1905. Dr. George E. Pfahler, 1930 Chestnut St., Phila.*

1915. Dr. Damon B. Pfeiffer, 1822 Pine St., Phila.*

1907. Dr. George W. Pfromm, Room 803, 269 S. 19th St., Phila.*

1907. Dr. Horace Phillips, 4505 Chester Ave., Phila.*
1911. Dr. George Morris Piersol, 1913 Spruce St., Phila.*
1933. Dr. Donald Marion Pillsbury, 3800 Chestnut St., Phila.‡
1917. Dr. Edmund B. Piper, 2031 Locust St., Phila.*
1905. Dr. Robert L. Pitfield, 5211 Wayne Ave., Phila.*
1922. Dr. Henry Pleasants, Jr., West Chester, Pa.*
1932. Dr. Roland De Lance Porter, Jenkintown, Pa.*
1931. Dr. Charles Allen Pryor, M.D., Laryngologist and Otologist, Pennsylvania Hospital and Chief of the Out-Patient Clinic; Assistant Otolaryngologist, Out-Patient Department, Bryn Mawr Hospital; Assistant in Otolaryngology, Graduate School of Medicine, U. of P. 1910 Spruce St., Phila.
1908. Dr. McCluney Radcliffe, 1930 Chestnut St., Phila.*
1931. Dr. Frank M. Ramsey, Chestnut Hill, Phila.*
1913. Dr. Alexander Randall, 1323 Medical Arts Bldg., Phila.*
1926. Dr. I. S. Ravdin, 4623 Larchwood Ave., Phila.*
1928. Dr. Warren S. Reese, 230 S. 21st St., Phila.*
1925. Dr. Rufus S. Reeves, 2227 Spruce St., Phila.*
1931. Dr. Robert P. Regester, 255 S. 17th St., Phila.*
1920. Dr. Martin E. Rehfuss, N. E. Corner 16th and Spruce Sts., Phila.*
1921. Dr. E. Paul Reiff, 5051 Chestnut St., Phila.*
1919. Dr. Stanley P. Reimann, 516 Arbutus St., Germantown, Phila.*
1929. Dr. George S. de Rényi, 212 S. 39th St., Phila.*
1923. Dr. Sidney J. Repplier, Roumfort Road, Chestnut Hill, Phila.*
1919. Dr. Russell Richardson, 320 S. 16th St., Phila.*
1919. Dr. Robert F. Ridpath, 1737 Chestnut St., Phila.*
1898. Dr. David Riesman, M.D., Sc.D., Professor of the History of Medicine, Professor Emeritus of Clinical Medicine, School of Medicine, U. of P.; Visiting Physician, Phila. General Hospital; Consulting Physician, Chestnut Hill, Jewish, Woman's and Kensington Hospitals. 1520 Spruce St., Phila.
1933. Dr. Damaso de Rivas, Lansdowne, Pa.‡
1932. Dr. Frederick R. Robbins, 258 S. 18th St., Phila.*
1899. Dr. Walter Roberts, 1921 Spruce St., Phila.*
1932. Dr. Harold F. Robertson, 327 S. 17th St., Phila.*

1903. Dr. William Egbert Robertson, 327 S. 17th St., Phila.*
1912. Dr. John Stewart Rodman, 1310 Medical Arts Bldg., Phila.*
1934. Dr. Harry L. Rogers, M.D., Clinical Assistant, Out-Patient Dept. of Immunology, Jefferson Hospital; Staff, Zurbrugg Hospital, Riverside, N. J., and Burlington County Hospital, Mt. Holly, N. J. Riverton, N. J.
1928. Dr. Edward Rose, 255 S. 17th St., Phila.*
1909. Dr. Randle C. Rosenberger, 1001 Walnut St., Phila.*
1932. Dr. Harry A. Rothrock, West Chester, Pa.*
1933. Dr. Leonard George Rowntree, The Barclay, 18th and Rittenhouse Sts., Phila.‡
1933. Dr. Jay Besson Rudolphy, 1924 Pine St., Phila.‡
1905. Dr. J. Torrance Rugh, 911 Medical Arts Bldg., Phila.*
1929. Dr. William J. Ryan, Medical Arts Bldg., Phila.*
1905. Dr. Paul J. Sartain, 2006 Walnut St., Phila.*
1908. Dr. Albert C. Sautter, Germantown Professional Bldg., Phila.*
1927. Dr. Gordon J. Saxon, 1506 Medical Arts Bldg., Phila.*
1906. Dr. Edwin S. Saylor, 1737 Chestnut St., Phila.*
1920. Dr. Hunter W. Scarlett, 230 S. 21st St., Phila.*
1917. Dr. J. Parsons Schaeffer, 4634 Spruce St., Phila.*
1932. Dr. Howard W. Schaffer, 3475 Midvale Ave., Phila.*
1929. Dr. Lewis C. Scheffey, 255 S. 17th St., Phila.*
1929. Dr. Harry P. Schenck, 1912 Spruce St., Phila.*
1917. Dr. Truman G. Schnabel, 1704 Pine St., Phila.*
1917. Dr. Charles H. Schoff, Media, Pa.*
1928. Dr. Frederick S. Schofield, 822 Medical Arts Bldg., Phila.*
1921. Dr. Edward A. Schumann, 1814 Spruce St., Phila.*
1887. Dr. George E. de Schweinitz, 1705 Walnut St., Phila.*
1930. Dr. John P. Scott, 1803 Pine St., Phila.*
1917. Dr. Charles A. Service, Bala, Pa.*
1924. Dr. Thomas A. Shallow, 3942 Chestnut St., Phila.*
1908. Dr. Charles E. G. Shannon, Room 1107, 1930 Chestnut St., Phila.*
1928. Dr. John S. Sharpe, Haverford, Pa.*
1928. Dr. Frederick C. Sharpless, Rosemont, Pa.*
1897. Dr. William T. Sharpless, West Chester, Pa.*
1931. Dr. William C. Sheehan, 8820 Germantown Ave., Phila.*

1932. Dr. Joyce T. Sheridan, 412 W. Durham St., Phila.*
1906. Dr. William G. Shields, 414 School Lane, Phila.*
1896. Dr. William T. Shoemaker, 2017 Locust St., Phila.*
1900. Dr. Edward A. Shumway, 1737 Chestnut St., Phila.*
1903. Dr. John F. Sinclair, 4103 Walnut St., Phila.*
1907. Dr. Francis W. Sinkler, 1226 Medical Arts Bldg., Phila.*
1902. Dr. E. Hollingsworth Siter, 2213 Delancey St., Phila.*
1928. Dr. Samuel R. Skillern, 1734 Pine St., Phila.*
1933. Dr. Donald Campbell Smelzer, Graduate Hospital, Phila.‡
1929. Dr. Austin T. Smith, 259 S. 17th St., Phila.*
1933. Dr. Lauren Howe Smith, 111 N. 49th St., Phila.‡
1927. Dr. Calvin M. Smyth, Jr., 2021 Spruce St., Phila.*
1919. Dr. Henry Field Smyth, Wayne, Pa.*
1933. Dr. Varnum C. Southworth, Germantown Professional Bldg., Phila.‡
1933. Dr. Edgar W. Spackman, M.D., D.Sc. (Med.), 1824 Chestnut St., Phila.*
1928. Dr. Edmund B. Spaeth, 1930 Chestnut St., Phila.*
1897. Dr. William G. Spiller, 4409 Pine St., Phila.*
1929. Dr. Marshall B. Sponsler, 1934 Spruce St., Phila.*
1894. Dr. B. Franklin Stahl, Haverford, Pa.*
1909. Dr. J. Clinton Starbuck, 42 East Washington St., Media, Pa.*
1927. Dr. Isaac Starr, Jr., 505 Cresheim Valley Rd., Phila.*
1912. Dr. Nathan P. Stauffer, 1900 Rittenhouse Sq., Phila.*
1910. Dr. Thomas C. Stellwagen, Jr., 220 S. 16th St., Phila.*
1895. Dr. Alfred Stengel, Maloney Clinic, University Hospital, 36th and Spruce Sts., Phila.*
1901. Dr. Arthur A. Stevens, 314 S. 16th St., Phila.*
1934. Dr. Harold L. Stewart, M.D., Associate in Pathology, Jefferson Medical College; Assistant Pathologist, Jefferson Hospital and Phila. General Hospital. Jefferson Medical College, Philadelphia.
1934. Dr. Sloan G. Stewart, M.D. Pacific and N. Carolina Aves., Atlantic City, N. J.
1914. Dr. Thomas S. Stewart, 1532 Pine St., Phila.*
1931. Dr. Merritt H. Stiles, 113 W. Chestnut Ave., Phila.*
1934. Dr. Cheney M. Stimson, M.D., F.A.C.S. Greene and Harvey Sts., Germantown, Phila.
1925. Dr. John H. Stokes, 3800 Chestnut St., Phila.*

1928. Dr. Joseph Stokes, Jr., 159 W. Coulter St., Phila.*
1934. Dr. Philip S. Stout, Pharm. D., M.D., Associate Professor of Otology, Graduate School of Medicine, U. of P.; Chief of Nose, Throat and Ear, Depart. of Allergy, and Assistant in the Out-Patient Depart., Nose and Throat, Jefferson Hospital. 269 S. 19th St., Phila.
1923. Dr. Edward A. Strecker, 111 N. 49th St., Phila.*
1923. Dr. William D. Stroud, 1011 Clinton St., Phila.*
1933. Dr. Harry Stuckert, 248 S. 21st St., Phila.*
1927. Dr. Samuel B. Sturgis, Ardmore, Pa.*
1934. Dr. Thomas J. Summey, M.D., Surgeon, Burlington County Hospital, Mt. Holly, N. J.; Assistant Surgeon, Pennsylvania and Children's Hospitals, Phila.; Instructor in Surgery, Graduate School of Medicine, U. of P. 1930 Chestnut St., Phila.
1930. Dr. F. William Sunderman, 2210 Delancey St., Phila.*
1928. Dr. William B. Swartley, 6002 Greene St., Phila.*
1934. Dr. John A. Sweeney, M.D., Instructor in Medicine, U. of P.; Visiting Physician, White Haven Sanatorium; Medical Chief and Cardiologist, Misericordia Hospital. 1900 Rittenhouse Sq., Phila.
1900. Dr. James Ely Talley, 1811 Spruce St., Phila.*
1933. Dr. Herbert W. Taylor, Haverford, Pa.‡
1931. Dr. Norman H. Taylor, 100 W. Evergreen Ave., Phila.*
1887. Dr. William J. Taylor, 1825 Pine St., Phila.*
1928. Dr. J. Earl Thomas, Drexel Hill, Pa.*
1907. Dr. T. Turner Thomas, 1737 Chestnut St., Phila.*
1927. Dr. J. Monroe Thorington, 2031 Chestnut St., Phila.*
1898. Dr. Edward Q. Thornton, 1331 Pine St., Phila.*
1930. Dr. Edward S. Thorpe, Jr., 133 S. 36th St., Phila.*
1912. Dr. Robert G. Torrey, 1716 Locust St., Phila.*
1934. Dr. Martha Tracy, A.B., M.D., Dr. P.H., F.A.C.P., Dean, Woman's Medical College. 516 W. Coulter St., Phila.
1908. Dr. Stephen E. Tracy, 1930 Chestnut St., Phila.*
1926. Dr. Gabriel Tucker, 326 S. 19th St., Phila.*
1933. Dr. Henry J. Tumen, 2022 Spruce St., Phila.‡
1894. Dr. Joseph Price Tunis, University Club, Phila.*
1923. Dr. Creighton H. Turner, 1731 Pine St., Phila.*
1929. Dr. Ralph M. Tyson, 334 S. 21st St., Phila.*
1907. Dr. Josephus T. Ullom, Carpenter and Quincy Sts., Phila.*

1934. Dr. George A. Ulrich, M.S., M.D., Clinical Professor of Obstetrics, Jefferson Medical College. 309 S. 12th St., Phila.
1873. Dr. Arthur Van Harlingen, Bryn Mawr, Pa.*
1903. Dr. William Turner Van Pelt, 59 Bethlehem Pike, Chestnut Hill, Phila.*
1933. Dr. Jacob Hursh Vastine, 2d, 1930 Chestnut St., Phila.‡
1912. Dr. Norris Wistar Vaux, 2031 Locust St., Phila.*
1903. Dr. William S. Wadsworth, 3914 Baltimore Ave., Phila.*
1927. Dr. Arthur J. Wagers, 1429 Spruce St., Phila.*
1928. Dr. George W. Wagoner, Haverford Gables, Haverford, Pa.*
1931. Dr. Herschel C. Walker, Wynnewood, Pa.*
1906. Dr. John K. Walker, M.D., Media, Pa.
1907. Dr. Warren Walker, 1819 Chestnut St., Phila.*
1932. Dr. Adolph A. Walkling, Medical Arts Bldg., Phila.*
1904. Dr. Joseph Walsh, 521 Medical Arts Bldg., Phila.*
1895. Dr. Arthur W. Watson, 2013 Locust St., Phila.*
1923. Dr. William R. Watson, 8 Balwyn Place, Bala, Pa.*
1932. Dr. Charles C. Watt, Jr., 6605 Wayne Ave., Phila.
1933. Dr. James Jamison Waygood, 3464 W. School Lane, Phila.‡
1903. Dr. Charles H. Weber, 2048 Pine St., Phila.*
1930. Dr. S. Dana Weeder, 6110 Greene St., Phila.*
1920. Dr. Fred D. Weidman, 20 Tenby Road, Llanerch, Pa.*
1933. Dr. Benjamin Paul Weiss, The Lenox, 13th and Spruce Sts., Phila.‡
1923. Dr. Edward Weiss, 1923 Spruce St., Phila.*
1913. Dr. P. Frailey Wells, 754 N. 40th St., Phila.*
1921. Dr. William Whitaker, 5448 Germantown Ave., Phila.*
1901. Dr. Courtland Y. White, 6611 N. 10th St., Phila.*
1925. Dr. Bernard P. Widmann, 250 S. 18th St., Phila.*
1914. Dr. De Forest P. Willard, 1726 Spruce St., Phila.*
1907. Dr. Carl Williams, School Lane and Greene St., Phila.*
1924. Dr. Horace J. Williams, 5908 Greene St., Phila.*
1920. Dr. Philip F. Williams, 2206 Locust St., Phila.*
1927. Dr. Ernest G. Williamson, 6353 Woodbine Ave., Phila.*
1916. Dr. Harry B. Wilmer, 6013 Greene St., Phila.*
1921. Dr. George Wilson, 133 S. 36th St., Phila.*
1902. Dr. Samuel M. Wilson, 1930 Chestnut St., Phila.*
1897. Dr. W. Reynolds Wilson, Villa Nova, Pa.*

1904. Dr. James W. Wister, 5430 Germantown Ave., Phila.*
1933. Dr. Michael G. Wohl, 1727 Pine St., Phila.‡
1918. Dr. Charles C. Wolferth, S. E. Corner 36th and Spruce Sts., Phila.*
1893. Dr. Alfred C. Wood, 2035 Walnut St., Phila.*
1932. Dr. Francis C. Wood, Wynnewood, Pa.*
1900. Dr. George B. Wood, N. E. Corner 20th and Chestnut Sts., Phila.*
1903. Dr. Horatio C. Wood, 319 S. 41st St., Phila.*
1897. Dr. George Woodward, W. Willow Grove Ave., Chestnut Hill, Phila.*
1928. Dr. Carroll S. Wright, 1402 Spruce St., Phila.*
1894. Dr. William Zentmayer, Room 803, 1930 Chestnut St., Phila.*
1895. Dr. Mason W. Zimmerman, 1518 Waverly St., Phila.*
1933. Dr. Jay D. Zulick, 2008 Walnut St., Phila.‡

NON-RESIDENT FELLOWS

(For degrees and titles see TRANSACTIONS, 1932, LIV, xi)

ELECTED

1883. DR. CHARLES BAUM, 123 W. Main St., Middletown, Pa.

1916. CAPTAIN WILLIAM H. BELL, M.C., U.S.N., 602 Redgate Ave., Norfolk, Va.

1903. DR. M. H. BIGGS, Rutherfordton, N. C.

1919. DR. DAVID R. BOWEN, Pennsylvania Hospital, 8th and Spruce Sts., Philadelphia.

1908. DR. WILLIAM W. CADBURY, Lingnan University, Canton, China.

1924. DR. BOWMAN C. CROWELL, 40 E. Erie St., Chicago, Ill.

1910. DR. W. TAYLOR CUMMINS, 975 Bush St., San Francisco, Cal.

1902. DR. CHARLES A. CURRIE, W. Walnut Lane, Philadelphia.

1897. DR. W. A. N. DORLAND, 185 N. Wabash Ave., Chicago, Ill.

1905. DR. JOSEPH S. EVANS, JR., 1300 University Ave., Madison, Wis.

1905. DR. WILLIAM EVANS, 500 W. Gay St., West Chester, Pa.

1913. DR. NATHANIEL GATES, 10 Peterboro Ave., Detroit, Mich.

1908. DR. EDWARD H. GOODMAN, Dorset, Vt.

1902. DR. NORMAN B. GWYN, 109 Madison Ave., Toronto, Canada.

1928. DR. JOSEPH M. HAYMAN, Lakeside Hospital, Cleveland, O.

1892. DR. GUY HINSDALE, White Sulphur Springs, W. Va.

1908. DR. A. PARKER HITCHENS, Major M.C., U.S.A., in charge 6th Corps Area Laboratory, Ft. Sheridan, Ill.

1912. DR. G. CARL HUBER, 1330 Hill Street, Ann Arbor, Mich.

1912. DR. JOHN W. HUNTER, McDaniel, Md.

1885. DR. EDWARD JACKSON, 217 Imperial Bldg., Denver, Col.

1900. DR. JOHN H. JOPSON, 1824 Pine St., Phila.

1910. DR. HOWARD T. KARSNER, Institute of Pathology, Western Reserve University, Cleveland, Ohio.

1887. DR. HOWARD A. KELLY, 1418 Eutaw Place, Baltimore, Md.

1916. DR. HOWARD A. MCKNIGHT, Tecumseh Bldg., Springfield, Ohio.

1900. DR. ROBERT PHILLIPS MCREYNOLDS, 213 S. Broadway, Los Angeles, Cal.

1911. Dr. Edward B. Meigs, 1736 M St., N. W., Washington, D. C.
1894. Dr. D. J. Milton Miller, 104 S. Jackson Ave., Ventnor, N. J.
1917. Dr. A. Graeme Mitchell, University of Cincinnati, Cincinnati, Ohio.
1915. Dr. John H. Musser, Jr., 1427 2d St., New Orleans, La.
1905. Dr. George W. Norris, Dimock, Pa.
1901. Dr. Henry Norris, Waverly Mills, S. C.
1926. Dr. John Rodman Paul, Dept. Internal Medicine, Yale University, New Haven, Conn.
1907. Dr. George E. Price, Stimson Bldg., Seattle, Wash.
1904. Dr. M. P. Ravenel, 203 Westmount Ave., Columbia, Mo.
1907. Dr. B. Franklin Royer, 11 Wyoming Ave., Tunkhannock, Pa.
1913. Dr. George L. de Schweinitz, 85 East Broad St., Bethlehem, Pa.
1908. Dr. Harlan Shoemaker, 1930 Wilshire Blvd., Los Angeles, Cal.
1932. Dr. Alvin E. Siegel, 609 Georgia Casualty Bldg., Macon, Ga.
1900. Dr. John M. Swan, 457 Park Ave., Rochester, N. Y.
1913. Dr. William Penn Vail, Blairstown, N. J.
1897. Dr. Clarence A. Veasey, Suite 1569, Paulson Bldg., Spokane, Wash.
1911. Dr. Andrew H. Woods, 1100 N. Dubuque St., Iowa City, Iowa.

HONORARY FELLOWS

(Limited to Fifty, of whom Twenty may be Foreigners)

American

ELECTED

1909. Crile, George W., M.D., Cleveland Clinic, Euclid Ave. at E. Ninety-third St., Cleveland, O.

1909. Dana, Charles Loomis, M.D., 53 West Fifty-third St., New York City, N. Y.

1916. Estes, William Lawrence, M.D., 805 Delaware Ave., Bethlehem, Pa.

1931. Garrison, Fielding H., M.D., 1900 E. Monument St., Baltimore, Md.

1912. McCaw, Brig.-Gen. Walter D., M.D., Assistant Surgeon-General, U. S. A., retired, Woodstock, Ulster Co., N. Y.

1906. Mayo, William J., M.D., Rochester, Minn.

1917. Miner, Charles H., M.D., 115 S. Franklin St., Wilkes-Barre, Pa.

1906. Pilcher, Lewis Stephen, M.D., 386 Park St., Upper Montclair, N. J.

Foreign

1928. Archibald, Edward, M.D., McGill University, Montreal, Canada.

1924. Hopkins, Sir F. Gowland, M.D., Biochemical Department, University of Cambridge, Cambridge, England.

1909. Macallum, Archibald B., M.A., M.B., Ph.D., Sc.D., LL.D., F.R.S., 317 Piccadilly St., London, Ontario.

1922. McCarrison, Major-General Sir Robert, Kt., M.D., C.I.E., D.Sc., LL.D., F.R.C.P. (London), Honorary Physician to the King. Pasteur Institute, Coonoor, S. India.

1924. Macleod, John James R., M.D., M.B., D.Sc. (Hon.), LL.D., F.R.S., Marischal College, Aberdeen, Scotland.

1906. Myles, Sir Thomas, M.D., 33 Merion Square, W. Dublin, Ireland.

1885. Rendu, Jean, M.D., Lyons, France.

1928. Rolleston, Sir Humphrey, Bart., G.C.V.O., K.C.B., M.D., D.C.L. (Durh.), LL.D., D.Sc., Martins, Haslemere, Surrey, England.

A SOCIOLOGIST LOOKS AT THE DOCTORS

By JAMES H. S. BOSSARD, Ph.D.

(*Professor of Sociology, University of Pennsylvania*)

The doctors are always looking at us poor humans, whether we are sociologists or not. Not content with external scrutiny, often of our unadorned selves, they use the X-ray to look through us, and the cystoscope to look inside of us, until no part of us is safe from their prying eyes. Some of them even specialize in psychiatry and psychoanalysis, to peer into our unconscious selves, and to find wishes where we feel only a vague unrest. The subject of this paper invites a reversal of this customary sightseeing procedure and permits us to give the doctors a taste of their own medicine.

Before one becomes a sociologist, or a devotee of any other pursuit, one is a patient of the doctors, whose coming into the world is irritatingly uncertain, and whose departure therefrom has a habit of confounding the doctor's prediction. Between these times, the doctor is the doorstep on which we lay our ailments, and the confessional to which we bring our sins and their aftermath. Ordinarily, we contact him only when our judgment is warped by our pains and our problems, and when our disposition is soured by our misfortune. With this backhanded appreciation, I shall proceed to multiply this individual relationship by 150,000 doctors and 122,000,000 patients; and with this forward-looking appreciation of the infinite size and variety of the task, I shall venture to select for further discussion, two fundamental phases of these relationships, against the changing circumstances of our American social life.

I

The first of these is the fundamental conflict between the recently emerging social attitude toward medical service and the traditions of the medical profession.

Sociologists today are rather impressed with the importance of attitudes, regarding them as basic realities in social situations. The existence of a widespread attitude certainly is something

which cannot be ignored, whatever one may think of its justice or soundness. In respect to the present discussion on the relation of the medical profession and the public, with its clashes, controversies and cross currents, it seems important to begin by analyzing the present attitude of the public toward medical service, to see how it has taken form, and what changes in it have taken place in recent years.

Time was when health, sickness, and the work of the doctors were regarded almost entirely from an individual viewpoint. With the exception of grave crises resulting from widespread epidemics, there was little, if any, conception of the social aspects or significance of health problems or health services. This attitude was the product largely of our isolated manner of living and our earlier individualistic philosophy.

In recent years this attitude has been changing, again as the result of our experience. At least four factors stand out clearly as contributing to this change, and to the emergence of the present attitude. The first of these has been the development of health work in the schools. Such work began in this country in the closing years of the nineteenth century, as an exercise of the police power of the state, with the employment of physicians in the schools to detect and control communicable diseases, primarily for the protection of the community. Somewhat incidentally in the pursuit of this work, physicians began to see, and as a result of their discoveries, educators began to realize, that a very large proportion of children in the schools were handicapped by physical defects of various kinds. Because the correction of these defects led so frequently to improvement in school work, the relationship between the two began to be recognized. This led in time to the extension of the scope of medical inspection to include the physical examination of school children, with the aim of discovering whether or not they were suffering from such defects as would handicap their educational progress and prevent them from receiving the full benefit of the educational opportunities furnished by the state. Twenty-five years ago, this work was in its infancy; today it is an integral part of our public school system. To physical examination have been added follow-up work for the correction of defects, systematic immunization against communicable diseases, the improvement of school sanitation, provision for the safety of children, and, in many cities, nutrition

work involving the actual feeding of undernourished children. In other words, there has grown up now a generation who, through the schools, have become accustomed to a reasonably adequate and free health service.

In 1917 and 1918, a great many of these persons, thus accustomed, went into military service. Now, if there is one thing which war makers have learned, it is the military importance of health. In all the wars of history, with the exception of the Russo-Japanese and the World Wars, much more disability and many more deaths resulted from disease than from wounds. A perusal of military history shows that, over and over again, campaigns which should have succeeded have failed because of the utter breakdown of armies from preventable diseases, such as cholera, plague, typhoid, smallpox, malaria, dysentery, and yellow fever. Profiting by the experience of the past, modern military leaders, with the aid of medical men, have made their armies an example and an inspiration for our public health authorities in times of peace, for disease is today controlled far more effectively in the camp than in the market place. This was particularly true during the World War, with the result that millions of young men who had become accustomed to a partial and free health service in the schools, had that experience continued and enlarged in the more effective health service which they received while members of our military forces.

After demobilization, these men went into industry, and here again, the same sort of development has been going on. More than twenty years ago, the larger corporations began rendering health service to their employees. In 1925, the United States Steel Corporation, for example, employed 225 company surgeons, physicians and interns, 117 "outside surgeons" on salary, 251 nurses, 62 visiting nurses, and 40 sanitary inspectors. A survey by the National Industrial Conference Board in 1930 showed a steadily increasing number of establishments conducting medical work, especially among plants employing fewer than 1,000 workers, or even fewer than 500. While the degree of completeness of the service provided in industrial establishments varies greatly, there has been a distinct trend toward increasingly complete service—ambulatory care, home care, and hospitalization. Most significant of all, perhaps, has been the marked tendency to provide, not only for the worker but for members of his family as well.

In other words, ever since the World War, an increasing number of employees, together with their families, have become accustomed to a fairly complete health service, supplied as an incident to their employment.[1]

A fourth factor in the creation of the present attitude toward health and health services has been the growing participation of organized government in health work. Perhaps the most spectacular instance of this in recent years has been the medical service rendered to veterans of the World War. Immediately after the War the federal government found it necessary to provide care for a large number of disabled men, and the original plan was to confine such responsibilities to veterans whose diseases or injuries had occurred in the line of duty. But the World War Veterans' Act of 1924 provided for the medical care of all honorably discharged service men. What this policy involved may be gathered in part from the fact that in 1929, Congress appropriated $15,000,000.00 for additional hospital, domiciliary and outpatient facilities for persons entitled to hospitalization under this Act.

Governmental participation in medical work is a much larger story, however, than its gratuitous treatment of War veterans. It includes the work of some 25 agencies in the federal government, chief among which is the United States Public Health Service, the separate state departments of health, and our city departments. It includes the diagnostic laboratories of the states and cities; the manufacture and distribution of biologicals; the operation of various governmental clinics, as for example, the state-wide systems of psychiatric clinics; and finally the rapidly increasing number of federal, state, county and city hospitals. Few citizens realize the extent to which the provision of hospital facilities has become a public service. In 1931, 73 per cent of all hospital service in the United States was provided by governmental agencies. Finally, in this brief summary of governmental participation in health work, mention must be made of the work done in the field of infant mortality under the provisions of the Sheppard-Towner Act, and the program of combatting venereal diseases inaugurated by the Chamberlain-Kahn Act of 1918.

Bringing all of these developments together, it appears that in school, in military service, in industry, and through govern-

[1] Moore, Harry H., "Health and Medical Practice" in President's Commission, *Recent Social Trends,* McGraw-Hill Book Company, New York, 1933, volume II, p. 1077.

mental agencies, we have developed an organized, effective, socialized medical and health service, gratuitously given to a large proportion of our population. Now it seems equally clear that people will not permanently compartmentize their thinking in such a matter. In other words, we cannot become accustomed to one set of values in regard to medical service when we are in school, in the army, and at work, and then have a separate set as a private individual or as a member or head of a family. What has been happening, logically and inevitably, has been a carry-over to the end that these experiences in school, army and workshop have led to the creation of a new social attitude toward health and health services.

How definitely crystallized this attitude has become, it is difficult to say, but it is clearly pointing in the direction of regarding health and adequate medical service as a social necessity, and perhaps it is safe to go so far as to say, as a social right. The great mass of people, in other words, are coming to look upon medical service as they do upon education and police protection. They consider protection against communicable disease much like protection against criminals, and the guarantee of physical well-being as they do the guarantee of property rights, all of them as rights in a modernized democratic society.

Over against this newer public demand for a socialized health service, that is adequate, effective, easily available, and cheap, if not gratuitous, stands a very old profession, dominated by individualistic conceptions, formulated through a very long and honored past, composed of men who have undergone a long period of training, who have invested a good deal of money and time and effort in their professional preparation, and who are confronted with the necessity of earning a living in accordance with the investment which they have made in that preparation.

Nothing that has just been said is meant to infer that doctors do not render effective service, nor that they do not do much free work, nor that they are not taken advantage of by many persons who can pay for medical service. I am not even expressing any judgment of the rightness of the newer social attitude. I am simply pointing out that it exists, extensively and insistently, and that it conflicts with the interests and conceptions of many private physicians. In other words, the sociologist sees a fundamental conflict between these two attitudes, which arises largely out of

past and current developments, out of social circumstances, without imputing any unworthy motives or personal criticisms into the existing situation.

This conflict is complicated, and in a sense intensified, by two additional facts. One of these is the type of service increasingly asked of the doctors. This is service that is primarily preventive. We want health, plus. We ask, in addition to the traditional types of medical treatment, an effective treatment of what has aptly been termed "recessive sickness," by which is meant the insidious and more subtle departures from health which lower vitality and efficiency. To the extent that doctors are trained and interested in dealing with these health problems, they need to utilize expensive equipment and the services of various specialized technical experts. And this costs time and money, particularly when these subsidiary services are not organized.

It is the demand for this type of service which goes to the heart of the present controversy regarding the cost of medical care. The statement is often made that doctors could give the same kind of service they gave thirty years ago, at the cost of thirty years ago. By and large, this may be true. But medical service has progressed greatly in thirty years, and so has the public demand concerning the kind of medical care, and the chief point here is that this progress and demand have outgrown the ability of people to pay, particularly when these newer services are unorganized.

A second complicating factor in the conflict emphasized above, grows out of the differences in economic status of the population. By the term economic status is meant "position in the social scale or social gradation so far as it is determined by ability to purchase goods and services."[2] What concerns us here are the differences in ability between social classes to pay for medical services, and what gives specific point to these differences is that the rates of sickness vary inversely with the ability to pay for medical services. As Sydenstricker and others have shown, the lower the income, the higher the sickness rate.[3]

II

The second basic factor which strikes the sociologist as he looks at the doctors concerns the spatial distribution of their serv-

[2] Sydenstricker, Edgar, Health and Environment, McGraw-Hill Book Company, New York, 1933, p. 84.

[3] Ibid., Chapter V.

ices. The studies of the Committee on the Costs of Medical Care have called attention to this fact in a general way. By way of illustration, it may be pointed out that in 1929, there was one physician to every 1,431 persons in South Carolina, and one to every 571 in California; one hospital bed to every 749 persons in South Carolina and one to every 154 in Wisconsin. When the study of distribution is narrowed down into urban and rural areas, the maldistribution is even more pronounced. There is a marked dearth of doctors in many rural areas. In these areas, even where general practitioners are available, there is a lack often of hospital facilities, of laboratories, of consultation service.

Interesting as this information on spatial distribution in general terms, such as sections, states, cities and country may be, one specific phase of this study has been overlooked, and that is the spatial distribution within our large cities. After all, 19 per cent of our population live in cities of 500,000 and more, and 15 per cent in cities of over a million. Certainly, cities of such a size warrant consideration as separate units. Accordingly, I wish to present at this point the results of an inquiry into the spatial distribution of doctors' offices within the city Philadelphia, made in the Department of Sociology at the University of Pennsylvania, under my direction.

In 1932, there existed, so far as our studies revealed, 3,733 offices in Philadelphia in which doctors met patients. These were located on a map of Philadelphia by street address. The city was then divided into certain areas which seemed relatively distinct, the number of offices in each area was counted, and this number compared with the population in these areas, as reported by the census of 1930. The results thus obtained follow.

Segregation of Doctors' Offices

(1) *The Downtown Business Area.* In this area, bounded by Market Street on the north, by Pine Street on the south, by Sixteenth Street on the east, and the Schuylkill River on the west, there are 872, or 23 per cent of the doctors' offices.

If this area is extended north to Arch Street and east to Seventh Street, it includes 964, or 25.8 per cent of the offices.

If the area is extended to Vine Street on the north, it includes 982, or 26.3 per cent of all doctors' offices.

(2) *The North Broad Street Area.* Including the census

tracts bordering on North Broad Street from Spring Garden Street to Wingohocking, one finds 391, or 10.4 per cent of the offices of physicians.

(3) *The South Broad Street Area.* This includes the census tracts on both sides of South Broad Street from South Street to the end, and comprehends 170, or 4.5 per cent of the doctors' offices.

If these areas are combined, the result is 1,543, or 41.2 per cent of all offices.

(4) *The West Philadelphia, South, Area.* This extends from 37th Street west to Cobbs Creek Boulevard, and between Market Street and Batlimore Avenue. Here are found 293, or 8 per cent of all offices.

(5) *The Hunting Park Area.* This is bounded by Hunting Park Avenue, Broad Street, and Germantown Avenue, and includes 157, or 4.2 per cent of the doctors' offices.

Distribution in Relation to Population

(1) In the area between Arch Street, Pine Street, Seventh Street and the Schuylkill, there are 25.8 per cent of the doctors' offices, and 1.4 per cent of the population. There is one doctor's office for every 29 persons.

(2) In Germantown and Chestnut Hill, the twenty-second ward, there are 8 per cent of the offices and 5.3 per cent of the population. There is one doctor's office for every 343 residents.

(3) In West Philadelphia, south of Market Street, there are 12.9 per cent of the doctors' offices, 11 per cent of the population, and one office for every 450 persons.

(4) In West Philadelphia, north of Market Street, there are 8.3 per cent of the offices, 9.9 per cent of the population, and one office for every 620 people.

(5) In the Manayunk and Roxborough section, there are 1.3 per cent of the offices, 2 per cent of the population and one office for every 800 persons.

(6) In South Philadelphia, south of South Street, one finds 8.2 per cent of the offices, 18 per cent of the population, and one office for every 1,166 inhabitants.

(7) In Kensington and Frankford, covering the area east of 5th Street, north to Wingohocking and then northeast from

Tacony Creek, one finds 9.4 per cent of the offices, 21.8 per cent of the population, and one office for every 1,216 inhabitants.

(8) In the fortieth ward in southwest Philadelphia, south of Kingsessing Avenue, there are 1.4 per cent of the offices and 3.8 per cent of the population. There is one office for every 1,910 persons.

Certain conclusions are obvious on the basis of these data. First, it is apparent that the doctors are segregated in the downtown office and business center, and along the main arteries of transportation. This is a natural development, incidental to the growth of the city, and the development of its transportation system. The same development, it may be added, is true of the churches and other types of organized services operating on a private rather than a public basis.

But a city grows, and its population moves. One of the incidents of size is diversity, which means that as population changes occur, they do so on a selective basis. In other words, one of the results of the growth of a city is the selective distribution of its population, and the segregation of natural social groupings in specific areas, which sociologists speak of as natural social areas. This distribution process takes place on the basis of many factors—language, race, culture, occupation, and economic status—and out of it emerges the city as a spatial pattern of distribution areas and population groupings.

All of this is very important to the spatial distribution of medical services, for it means that the problem is one not only of numbers but also of population and social types. There are, in Philadelphia, as in every large city, distinct areas, peopled by distinct social types, with their own distinctive needs for medical services. There are areas peopled exclusively or largely by racial groups. There are areas composed of poor people, with relatively high rates of sickness, and areas occupied by relatively rich people, with relatively low rates of sickness. What this means again is an inevitable conflict between medical demands, socially conceived, and medical services, conceived from the standpoint of a private profession. Socially speaking, medical service is most needed in poorer areas; professionally, it is natural and inevitable for doctors to follow their paying patients.

The problem of spatial distribution is complicated further by specialization within the medical field. This tendency is a matter

of common observation and common emphasis. The Committee on the Costs of Medical Care points out that 45 per cent of the physicians of the country have limited, completely or partially, their practice to a specialty. Obviously in a place like Philadelphia the percentage would be higher. The significance of specialization in this connection is obvious. It means that in addition to the difficulty of finding a neighborhood doctor, there is the added difficulty of finding one who is interested in the patient's particular ailment.

Meanwhile, the hospitals have not moved. They have had to stay, while the population of the city has changed and been shifted. As a result, many hospitals in Philadelphia, as in all of our older and larger cities, find themselves in areas of congested population, surrounded by people of low economic status and with definite and numerous health needs. The result has again been inevitable. Hospitals have organized medical services for their neighborhoods, and this has given rise to the conflict between the hospitals as health centers and the interests of privately practising physicians.

III

One more word. All of these conflicts are complicated by the attitude of many leaders of the medical profession. Being well entrenched, and with no difficulties of earning a livelihood, they are reluctant to face any changes. Being well off, they are interested in maintaining the status quo.

The danger is that they may be too arbitrary. This would be unfortunate. If the sociologist's study of similar situations of social conflict confers any privilege of making a prediction, it would be this: that entrenched conservatism can lead only to violent reaction. Perhaps this means that a refusal to socialize medical service is to ride directly into the storm of state medicine.

ABUSES OF MEDICAL CHARITY AND OF THE FREE SERVICE OF PHYSICIANS

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Abuses of medical charity and of the free service of physicians represent important items in the costs of medical care. They are deformities of the skeletal structure of social economics. They are malignant neoplasms which defeat the very purpose of generosity. They are not new.

Throughout my medical experience, I have listened to complaints by hospital workers of many people who crowd wards and clinics without the slightest moral justification, presuming upon the timidity or cupidity of hospital management to permit them to get something for nothing. During the days of easily balanced budgets the prevailing spirit of laissez-faire shrank from registering complaints which promised nothing but futility. The alarms of economic chaos, now stimulate demands for relief from oppressive burdens and inspire inquiry into the devious ways of special privilege. The pinch of privation has awakened the physician to the realization that too long he has been working for nothing more than patronizing praise for his untiring devotion to the ideals of the science and art of medicine and too long has been a willing instrument in the hands of exploiting interests.

The contribution of the physician to medical charity is entirely disproportionate to his financial status. Beginning in feudal days as a special physician to a wealthy patron, who dispensed his physician's services to the poor as a part of his lordly patronage; down through the centuries the spirit of service to the poor has been carried by him without complaint. All of this tradition is his cherished heritage. His scientific accomplishments are his special pride. He despises the individual who commercializes a discovery or boasts inordinate profit from a special technique. His discoveries are disclosed to all without concealment or capitalization. He is the willing servant of the sick, but when he is told that at least one fourth of his American brothers are carry-

ing on with annual deficits and at the same time it is reported that "they are contributing their share of about $600,000,000 worth of free medical care, mostly in clinics and hospitals, where every other individual concerned is paid for his services except the physician," he is rising to his feet and demanding the expulsion of the impostor from the charity hospice and relief from his own tax burden by minimum payment for his services to tax supported institutions.

In Westchester County, New York, the contribution of the attending physicians in the fifteen general hospitals of the county was conservatively appraised at $1,857,873.00 for the year 1933 while the contribution of the hospitals themselves amounted to $1,801,503.00 most of which has been repaid to the hospitals from public and private charity funds. The cost of medical charity to the hospitals is thus seen to be less than the contribution of the medical profession—no part of which is ever to be returned. This sample I am sure can be matched in suburban Pennsylvania and the proportionate contribution of the medical profession everywhere will be much the same.

In France the problem also seems to be acute as indicated in a letter from a foreign correspondent of the *Journal* of the American Medical Association:

Paris, Dec. 13, 1933. The Abuse of Hospital Privileges by the Wealthy Class:—"The surgeons are protesting against the abuses that have arisen in the admission of well-to-do patients to the public hospitals, whereby their private interests are greatly injured. In France, the public hospitals are reserved for the indigent. The expenses of the hospitals have increased enormously, during recent years, by reason of the higher wages of the nursing personnel, and the application of the new social laws; more particularly, social insurance, which is a very costly system, and the eight-hour day law, which has made it necessary to double the nursing personnel. The municipal councils pay the cost of hospital treatment for indigent patients, and, furthermore, the budget of the city of Paris grants to the Administration de l'Assistance Publique Parisienne an annual appropriation exceeding 40,000,000 francs ($2,400,000), and yet the Assistance Publique has a deficit. Many of the poorer communes are in arrears in paying the hospital charges for their respective patients.

"The well-to-do class is not as reluctant as formerly about

being cared for in the public hospitals, since, for a small supplementary charge, a private room can be secured. It pays the fixed charges to the hospital, which is quite content to cater to this prompt paying clientele. The sums received as surgeon fees are clear profit, since the surgeon is paid a fixed annual salary by the administration and he is prohibited from accepting fees from patients. The surgeons of Paris thus find their incomes diminished. They demand energetically that the public hospitals be reserved, as formerly, for the indigent; that is to say, for persons listed at the Bureau of Charities or who furnish proof that they pay only a minimal house rent. The scandalous spectacle of rich patients coming to the hospital in luxurious cars to consult a specialist for the sum of sixty cents, the fee established for the poor, or undergoing an operation for appendicitis or fibroma at the hospital, free of charge, by the same surgeon that they consulted at home, must cease."

The Bronx County Medical Society has been actively interested in public health for twenty years and the membership has become increasingly vocal in expressing disapproval of the abuses of free hospital service. While sympathetically supporting all volunteer organizations which labor for the relief and rehabilitation of the poor, the Society has consistently deplored paternalistic activities which exploit physicians. The Society objects to loading upon the taxpayer unnecessary burdens of hospital operation, while non-governmental hospitals carry many empty beds, and objects to loading upon the taxpayer the expense of caring for many people who are able to pay for medical service in their homes or in private institutions. The Society is especially interested in tax problems because the physician is the only double taxpayer concerned in the care of the sick, adding to his normal taxes free care of all patients in City hospitals. The Society has never disapproved of the free hospital care of the emergent sick whatever their financial status, but after the emergency has passed the Society believes that these people, if financially able, should be removed to their homes or to private institutions and returned to the care of their own physicians. The Society believes that all non-emergent patients whose incomes or the incomes of whose families are competent to provide them with medical care by private practitioners should be denied the hospitality of the City. While it cannot be denied that active and ambitious physicians

desire and compete for positions on the staff of the City hospital, lured by scientific interest and an opportunity for study and advancement of professional prestige, it cannot be too strongly emphasized that all of the service of these hospitals in wards or dispensaries is given without the expectation of any financial rewards and is absolutely free.

Last year the Committee on Economics presented a careful minimum estimate of the value of free services given by physicians on the staff of one city hospital in the Bronx as $1,347,-155.00 in one year. Inasmuch as the three City hospitals of Bronx County have about the same census it is reasonable to multiply this figure by three and claim that $4,041,465.00 is a minimum valuation of the free services by physicians in these three institutions. Abuse of the City's hospitality represents but one phase of a social trend which has been enjoyed for many years by many people who justify themselves by claiming that residency within the city, or employment by the city, entitles them as direct or indirect taxpayers to all kinds of free services, liberal education, transportation at low rates, and special privilege of every sort. They believe that usage has finally created a right, and thus an unbearable incubus has been loaded upon the breaking back of the taxpayer.

During March, 1933, Dr. Frederick Flynn, President of the Morrisania City Hospital, Dr. William Klein, President of the Bronx County Medical Society and Dr. Van Etten, Medical Director of the Morrisania City Hospital, discussed these questions, organized themselves as an investigating committee, and decided to try out a credit questionnaire which has been for several years in successful use at the Buffalo City Hospital. Two hundred prenatal and adenoid and tonsil cases were interviewed in this manner with the result that 20, or 10 per cent of these applicants were found to be able to pay for obstetrical or operative care in private or semi-private institutions.

Encouraged by this experience the "K" Credit Service Bureau, Inc., of 381 Fourth Avenue, New York, was engaged to study 1,000 unselected patients applying for hospitalization excluding prenatal or adenoid and tonsil applicants and emergent accident cases. The study was to apply to ability to pay or ability to obtain credit, after the manner of commercial rating. Every patient was asked to answer the Buffalo questionnaire by repre-

sentatives of the agency at the hospital. The completed blanks were then handed to investigators who tried to get financial data, living conditions, ownership of income-producing property or business, or income from employment or family income. A letter concerning each of these patients including financial statement and credit rating was attached to each questionnaire and returned to the committee. The questionnaire used in the investigation was calculated to draw out all possible pertinent information not only regarding the applicant but also regarding members of the applicant's family. In addition to the usual questions concerning address, age, married or single state, race, birthplace, past and present occupation, church and fraternal affiliations, etc., it sought detailed information about income from business, property or relief agency, about living conditions, about indebtedness in connection with rents, insurance, mortgages and taxes. In addition it sought information regarding the source of past medical attention, including the name of the last attending physician and the source of the reference to the Morrisania Hospital, and the name and address and telephone number of some one who could verify the truth of the applicant's story.

It must be remembered that no period in our history was less favorable to such a study, when everyone was more or less financially embarrassed, when ownership of property was often a liability rather than an asset, when income and credit based upon income were the only things to be considered. The hospital was unusually crowded for the time of year and patients were resentful of questioning, evasive in answering. Some absolutely declined to answer. A few actually left the hospital admitting office and went elsewhere rather than answer questions. It must also be understood that the Credit Bureau was interested in nothing but factual statements, applying business methods with which it is constantly familiar in the extension of credit, an entirely different approach from that used by physicians whose judgments are swayed by sentiment and emotion.

The Bureau classified the reports in the following manner:

Class 1. No tangible financial responsibility. Present conditions warrant assistance.

Class 2. These are in a position to pay a fee of $75.00 or more. This classification includes patients who are under age and whose parents have financial means. It also includes the individual who has a position and those who are property owners.

Class 3. Patients under this classification are in a position to pay $50 to $200 with the aid of parents, grand-parents and other blood relatives. There are a number of individuals under this classification who have not sufficient financial means of their own; however, their parents are working and are receiving incomes. Others are property owners, while several are the owners of a business, or have tangible assets. It also includes both single and married brothers and sisters who are living at home or elsewhere and who are in fairly good circumstances. While it is true, they are not legally responsible, morally, the responsibility is theirs.

Class 4. Under this classification are included the patients, who with their relatives and reference given cannot be located at the address given.

Class 5. The investigations under this heading are what may be termed questionable risks. Each case, we believe requires individual attention. In other words, they are on the border line as to their ability to pay for services rendered.

While the Credit Bureau advises extension of credit sufficient to cover all cases in Class 2 requiring medical, surgical or obstetrical service, the committee's viewpoint differs. The committee recommends free hospital service only to the medical indigent and to all emergent cases regardless of financial responsibility. The committee defines a medical indigent as one who is compelled to do without the necessities of life in order to pay for medical care, or one who in any circumstance is unable to provide himself or his family with the necessities of life. The committee also believes that no fixed standard of financial assets can be established as a basis of ability to pay for medical care, instancing the fact that many people who could afford to pay for any illness which required hospitalization of two weeks would be unable to pay for the medical care involved in a long illness such as subacute bacterial endocarditis. The committee believes that unmarried persons with personal incomes of less than $1,200 or married persons with family incomes of less than $1,800 may be entitled to free service in a city hospital. Many physicians will think that the committee's position is too liberal here and that they would gladly give extended credit to many people whose incomes fall below these levels. For the purpose of this study the committee has deliberately understated its estimates in order that there may be no question about the real value of its statistics.

The committee's final classification is:

Class	Number	Description	Percent
I	583	Patients unable to pay	58.3
II	118	Patients able to pay	11.8
III	107	Patients able to pay with help of family income	10.7
IV	85	Patients furnishing false addresses	8.5
V	107	Patients possibly capable of paying a physician or of obtaining credit from a physician or of paying minimum rates in a semi-private institution.	10.7
	1,000		100.0

There is no doubt in the mind of the committee about the honesty of the patients in Class I. It is interesting to note that these people seemed to have very little hesitation in answering questions, some of them volunteering the information that they were willing to pay minimum amounts. On the other hand, there was great difficulty in securing frank response from the 40 per cent who make up the debatable classes. Most of the patients in Classes III and V would have been cared for without hesitation by private physicians for moderate fees or with deferred credit. Those in Class IV were largely cheaters who feared a credit investigation. One of them was accidentally found to be the father of a manager of an important business in 42d Street. Some homeless people concealing their poverty under false addresses may of course be included in this class; but it is unlikely that any considerable part of the class is composed of such people.

The Morrisania City Hospital cared for 16,001 patients during the year 1933, who averaged a stay of 11 days in the hospital at a per diem cost to the city of $4.12. It is unlikely that there would have been much change in percentages if all of these patients had been classified. Our first study of pre-natal and adenoid and tonsil cases showed 10 per cent able to pay. The larger group shows 11.8 per cent with similar ability. Based upon a generalized estimate, it seems quite safe to state that at least 1,600, or 10 per cent of the patients treated in the Morrisania City Hospital during 1933 were able to pay for medical care, were imposing upon the generosity of the city, were occupying the beds of the poor. It seems fair to state that at least 1,600 patients at $4.12 per diem stayed in this hospital an average

of 11 days and defrauded the taxpayers of the City of New York of a very considerable sum. There is little doubt that another 10 per cent, or those placed in Class III, could have paid with the help of their blood relatives (parents, children, brothers, sisters) and would have paid private practitioners if there had been no easy entrance to a public institution. The Credit Bureau believes that one third of those in Class V were able to pay with help, and most of the cheaters in Class IV could have paid a private physician for two weeks' care of ordinary illnesses such as those for which the average patient was hospitalized. An extension of these figures for the care of 40 per cent of 16,000 patients for eleven days at $4.12 per diem to the eight large general acute hospitals of the greater City of New York, with every allowance for variations in the financial character of the patients would run into figures that even hard boiled politicians would respect.

These statistics will undoubtedly be disputed, but the fact that the taxpayers of the City of New York are hospitalizing a very large number of people who are perfectly able to pay for private care is indisputable. It is also undeniable that physicians who always work without pay in the care of patients in the public hospitals defraud themselves and practitioners who have no hospital connections by complaissantly serving these patients with the real luxuries of excellent medical care without protest and in a spirit of submissive recognition of the futility of trying to do something about it. The Committee believes that this is a mistaken attitude and that these physicians should cooperate with the county medical society in a sincere effort to correct these abuses. It is obvious that the city hospital is in active competition with all physicians and in ruinous competition with non-governmental hospitals which through recent additions more than amply provide for the citizens of New York. If the admission of unworthy applicants can be controlled, over-crowding will be relieved, the poor will have better treatment, non-governmental hospitals will be helped, private practitioners will have more patients, and the city of New York will save a very large sum of money. It must be conceded that most of the applicants were people of small means, and that there really were very few patients comparable to the one who made a will distributing an estate of $100,000 the day before his free operation. Nearly 40 per cent of them, however, were competent to pay private prac-

titioners ordinary fees for the same service they required in the city hospital and therefore should have been denied free service.

The Committee recommended that an active credit agency should be set up in every city hospital to determine the financial responsibility of every applicant for treatment, and that there should be a central coordinating agency for the detection of persistent violators of administrative standards established by these agencies. The Committee presented this statistical indictment of a social condition which has evolved from municipal carelessness with a growing conviction that the times are ripe for an awakening of the public conscience to a realization that common honesty demands a fair deal for the hospitals, for the patients who use them, for the taxpayers who pay for them, and finally for the private practitioners.

Another form of abuse of medical charity is the use of the ambulance physician in place of a private physician by people well able to pay. Here is an actual case: March 28, 1933, 11:16 p.m.: Rose Wolfson, 1246 Blank Ave., called an ambulance; toothache; Intern Miller responded. April 1, 1933, 1:15 a.m.: Helen Wolfson, 1246 Blank Ave., called an ambulance; grip; Intern Fox responded. April 5, 1933, 6:55 p.m.: Helen Wolfson, 1246 Blank Ave., called an ambulance; acute pharyngitis; Intern De Georgio responded. April 9, 1933, 2:17 a.m.: Helen Wolfson, 1246 Blank Ave., called an ambulance; indigestion; Intern Clahr responded. April 9, 1933, 8:41 p.m.: Robert Wolfson, 1246 Blank Ave., called an ambulance; dizzy spells; Intern Zingaro responded. April 10, 1933, 8:34 p.m.: Robert Wolfson, 1246 Blank Ave., called an ambulance; coronary disease; admitted; Intern Zingaro responded. April 13, 1933, 2:34 p.m.: Helen Wolfson, 1246 Blank Ave., called an ambulance; grip; Intern Taus responded. April 16, 1933, 8:30 p.m.: Helen Wolfson, 1246 Blank Ave., called an ambulance; malingering, generalized pains; Intern Rosenbluth responded. April 17, 1933, 4:50 p.m.: Helen Wolfson, 1246 Blank Ave., called an ambulance; heart attack; Intern Zingaro responded. April 18, 1933, 10:14 a.m.: Helen Wolfson, 1246 Blank Ave., called an ambulance; heart disease; Intern Clahr responded; admitted to 7-w; discharged 5:22 p.m., April 18. 1246 Blank Avenue belongs to Robert Wolfson.

All over the country, county medical societies are discussing the economic position of the physician and the spread and ef-

fectiveness of his service. From these discussions it is reasonable to expect the emergence of new and practical plans. Immediate steps should be taken to put medical organizations behind movements which shall convince the taxpayer that the medical profession sincerely stands for tax relief and is ready to assume its share of the care of the indigent sick.

I suggest thoughtful consideration of the following program: (1) Protection of the interests of the taxpayer now violated by the abuse of medical charity. (2) Protection of the interests of the taxpayer by coordination of all hospitals, municipal, semi-private, or private by a central information exchange, designed to eliminate unnecessary duplication and waste. (3) Protection of the public health by immunization administered by physicians in their own offices. (4) Protection of the public health by the examination of school children, conducted by members of the County Medical Society. (5) Protection of the public health by the examination of food handlers by members of the County Medical Society. (6) Protection of the public health by the medical service of baby clinics and tuberculosis clinics by the County Medical Society. (7) Protection of the patient from poor medical service in crowded public clinics. (8) Protection of the sick or injured employee from poor service by physicians of low character or low ability. (9) Protection of the physician and other taxpayers from the diversion to tax supported hospitals of patients who are financially able to pay their own bills for medical care.

I am confident that the medical profession in America will assume the leadership of efforts to correct present abuses of medical charity and will succeed in maintaining high standards of distinguished service.

300 East Tremont Ave.

MEDICAL PRACTICE AND PUBLIC NEEDS

By EDGAR SYDENSTRICKER

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Any discussion of medical practice and public needs will be fruitless unless certain taboos are firmly, albeit irreverently, swept aside and certain shibboleths are disregarded. It is necessary at the outset to be somewhat ruthless in this respect although it is realized that taboos and shibboleths must be taken into proper account as pathological phenomena. The subject before us is one to be considered dispassionately, objectively, and with as much intellectual honesty as we are capable of giving it.

The principal taboo which we must discard is that the provision of medical care is a mysterious and sacrosanct realm into which only the physician may enter and at whose portals all others must genuflect. We are solemnly warned by one county medical society, for example, that "no governmental or voluntary organization has any more right to assume this responsibility (the prevention of disease) than the responsibility of furnishing medical care to all who are sick." Or, as the recent utterance of a distinguished head of another county medical group put it, "organized medicine is the logical trustee of society in the care of public health." This is a stultifying taboo easily dissipated by a moment's rational thinking. Society, for its own protection, has determined the qualifications of those who practice medicine and, having set these standards, has given physicians the right and imposed upon them the duty to decide *what* shall be practiced; society has left to the physician the content of medicine. But society always has had and always will have the power and the right to determine *how* medicine is practiced, *how* the services of physicians and others who render medical care shall best meet its needs, *how* public health and welfare can best be promoted thereby. Peculiarly inane also are the familiar shibboleths, "socialism," "rugged individualism," and the like which appear *ad nauseam* in discussions of medical practice in relation to public

needs. A leading medical journal, for example, characterized even the feeble proposals of the majority report of the Committee on the Costs of Medical Care as "socialism and communism—inciting to revolution!" Childish tactics such as these would be merely amusing were it not for the danger that the public may tire of them and take ill-considered actions that may disregard the rights and responsibilities of the medical profession—a contingency to be avoided by all persons, both lay and medical, who have the public weal at heart.

At any rate, let us not be excited to unreasoning fury if in the course of our discussion we come across something to which unthinking persons have attached meaningless epithets. Quite frankly I say at the outset that I propose to consider the subject assigned to me from the point of view of public needs. We shall regard the physician as a necessary servant of society but we shall proceed upon the principle that public needs for medical care cannot be met unless he is given full opportunity to render his service in the best possible ways.

Public Need of Medical Care

The following postulate is submitted as the basic principle in a discussion of medical practice and public needs:

Medical care is necessary for the maintenance of the health of the people and should be provided to all who need it.

This proposition is, I assume, unassailable if we grant that the welfare of the people is a goal of civilization and that medical care can contribute to that end.

A proper corollary is that any system of medical practice must be judged by the extent to which good medical care *is* afforded to all who need it. Let us, as objectively as we can, apply this criterion of public needs to present-day medical practice. The actual situation in so-called "normal" times as revealed recently by inquiries conducted under the auspices of the Committe on the Costs of Medical Care and by other studies may be summarized as follows:

There are about enough doctors, nurses, and others who furnish or assist in furnishing medical services—about a million persons all told—to take care of all illness and to do nearly all the preventive work for individual patients that we now know how to do. There is being spent annually by the American people about three

and a half billion dollars for doctors, dentists, hospitals, nurses, medicines, and all sorts of medical services, good and bad. This is enough money to purchase reasonably adequate medical care at current average prices. Yet in a year's time, even in a prosperous era, millions of families cannot afford to obtain any medical care; hundreds of thousands of cases of sickness needing medical attention are unattended; less than seven per cent of the population have even a partial physical examination and less than five per cent are immunized against some disease. Although medical science is still far from having solved all the mysteries of ill health, only some of the knowledge already gained is applied to all the people needing medical care.

We may go further and say that the lack of medical care, preventive and curative, is reflected in the general situation as regards health. Although we are accustomed to boast of achievements in medicine and public health as manifested in a lowered mortality among infants, children, and younger adults, the death rate among adults of middle and old age has not appreciably diminished in the past fifty years. By reason of restrictions upon immigration and the decline in the birth rate, we are becoming an older-aged people and can no longer afford to impair vitality as we have done in the past. Even the mortality among mothers and infants in a large class of the population of the United States is still far above that in some other countries. The incidence of illness from preventable and curable causes among persons of every age still is disconcertingly great. The prevalence in all classes of preventable and remediable defects and impairments, physical and mental, is shockingly high. The real effects of the economic depression upon the health of the population have not yet been manifested to their full extent. The favorable death rate in the years 1930–1933 is a gratifying indication that public health and curative medicine have been effective in some directions and that relief has prevented deaths, but it is not evidence that national health has attained its highest level. Signs are accumulating that the American people are not going scot-free from damages to health in this depression. Increased mortality rates, especially from tuberculosis and among infants, and more malnutrition among school children are already appearing in some areas and in some groups of the population. Recent inquiries are revealing not only a higher sickness rate among the poor as com-

pared with those more favorably situated, but also a higher rate among those who have suffered the most marked economic change during the past three or four years. These differences in mortality, morbidity, and impairments are definitely correlated with the extent to which preventive and curative medicine is provided.

The Nature of the Economic Problem Involved

It is impossible, of course, to find a simple, complete explanation of so complex a situation. Among the most important factors involved, however, is the economic organization of medical service. It is always dangerous to be brief in an analysis of a complicated subject, but the underlying economic circumstances may, I think, be fairly summarized by a statement of four incontrovertible facts:

(1) Medical care for the great majority of our population, under the economic system which we have developed, is a service to be bought when needed. This means that most medical care is produced as an economic "service," has a price, and must be paid for in the market. Four-fifths of the producers of this service are not salaried employees or wage-earners; they are professionally and expensively trained entrepreneurs who, within certain legal restrictions and self-imposed "ethical" limitations, are engaged in business for profit. Under existing conditions the greatest opportunity for profit is afforded by well-to-do purchasers and the competition for profit is active.

(2) Although fairly accurate predictions can be made as to when and how much of this service is needed by the people in mass, the incidence of sickness in any individual family during a given period of time cannot be foreseen. This means that the most costly forms of medical care must be purchased by the individual family in emergencies and out of current funds.

(3) Under the American economic system the distribution of purchasing power is so unequal that even in most prosperous years, and even if foresight and thrift were common characteristics of human beings, a very great majority of the individual families is unable to provide against these emergency needs for medical service.

(4) The "business," if I may use the term, of medical practice is not profitable to all who are engaged in it because those

who need the service cannot pay for it and because of the high cost of maintaining many competitive enterprises. Such facts as are available show that in 1929 one-third of all physicians had net incomes of less than $3,000 and one-half less than $3,800. If we grade physicians in income intervals of $1,000, more physicians would be found in the $3,000–$4,000 class than in any other. And this was in the halcyon days! Even in 1929, for every physician who earned a net income of more than $10,000, there were two who earned less than $2,500; for every dentist who earned more than $10,000, there were four who earned less than $2,500! The obvious conclusion is that the doctors are not getting rich. That is putting it far too mildly, however. When we consider the investment in the doctor's training and his responsibility, the inescapable conclusion is that *large proportions of medical practitioners are not being adequately remunerated.*

The economic problem to be solved in the socially essential task of providing medical care to all of the people thus narrows down to that of providing for adequate payment of those who render reasonably efficient service to the entire population under an economic system that postulates a grossly unequal distribution of ability to pay. Many other problems are, of course, involved. Among these are the improvement of medical education and of the quality of medical service, the elimination of unnecessary costs, the proper coordination of private practice with public medical and health services, the maintenance of personal relationship between doctor and patient, the definition or even the regulation of specialism in medical practice, and the like. The subject has many angles and implications, each of which will appear to be of first importance to some persons and less important to others. But in this brief discussion, I would like to direct attention chiefly to the economic phases of the subject.

Possible Approaches to a Solution

In what direction may an approach be made toward a solution of the basic economic problem?

Since we are to be practical minded, we must take cognizance of certain relevant circumstances. First among these is recognition of the public's responsibility for certain types of medical service. It is well established that the medical care of the indigent

and dependent sick, the institutional care of the mentally diseased, the tuberculous and possibly other sick persons is an obligation or a concern of society to be discharged either through official or philanthropic agencies or both, and that measures for the control of communicable diseases are public functions.

It should be realized also that any program of action which may be given serious consideration at present must assume the continuance of the economic system under which we now live—a system which is characterized by a grossly unequal distribution of wealth and of ability to pay for the essentials or the luxuries of life. Obviously, such an assumption does not preclude a course of action that may be followed by some other nation existing under an entirely different economic system. We can have even a better socialization of water supply than the U. S. R. R. or a more common-sense individualism in hygiene than China without being either communistic or ancient.

It should be realized further that any arrangement for medical services which may seem advisable for the attainment of the objectives already set forth should interfere as little as possible with the conditions of private practice as they actually exist in the United States, whether they be economic or professional. Again, a sound program for the provision of medical care must recognize the diverse conditions which prevail in widely different areas of our country, permit the proper development of group medical practice, and insure an efficient coordination of curative and preventive services whether these are furnished by private physicians or by public health and public medical agencies.

These are some of the conditions to be met. Many proposals have been made, but I venture to summarize the principal approaches as follows:

(1) *By undertaking no definite or planned social action, but trusting to a process of evolution and more or less casual experimentation.* In this evolutionary process several major movements are, I think, discernible at present. There is an increasing prevalence of group payment of medical costs, especially for hospital service and, to a considerable extent, for physicians' care. There are the definitely expanding activities of government in furnishing diagnostic and curative, as well as preventive, care. The interest of private practitioners in preventive medicine is developing. The tendency toward group, as distinguished from individ-

ual, practice is clearly manifest. There is a widening interest in the possibilities of improving the education of general practitioners, and restoring "family doctors" to a central position among their professional colleagues. This is accompanied by a growing demand for the effective control of specialization in the professions.

(2) *By the commercial organization of medicine and medical services on a large scale* along lines similar to those on which public utilities and railroads have been developed, namely, mass production by private interests and distribution at prices regulated by the public.

(3) *By making all medical services a governmental function,* either by the gradual development of public medical services along lines already fairly well established, or by some other revolutionary action. In either case, it would mean that all those who render these services would be employed by the public and that all institutions and facilities for such services would be owned and operated by the public.

(4) *By applying the principle of compulsory insurance on a state-wide or on a nation-wide basis.* This presumably would involve: governmental control and operation of health insurance; contracts with physicians and allied medical institutions; contributions from all insured persons and, under certain conditions, from employers; and a close coordination of the provisions for medical care with public health functions.

The first approach, i.e., faith in evolution, is by definition not even an approach. It is merely the doctrine of *laissez faire.* It is the refuge of those who are satisfied with their lot and are cautiously optimistic. Both the majority report and the principal minority report of the Committee on the Costs of Medical Care were based on this philosophy of social responsibility and evolution, although the majority report did make some specific recommendations as to community medical service which the minority report characterized—quite correctly, I think—as having "no relationship to the question the Committee set itself to solve," and voluntary health insurance which the minority report—again quite wisely—regarded as less effective than compulsory insurance. The *laissez faire* proponent in this instance either minimizes the need for action * or concludes that the

* For example, Leland, R. G., and Simons, A. M.: "Do We Need Compulsory Public Health Insurance? No." *Annals of the Americal Academy of Political and Social Science,* November, 1933, pp. 121–122.

dangers, actual or feared, which are inherent in new proposals outweigh the existing evils.

There is a general unanimity of opinion against any approach to the solution in the second direction mentioned above, i.e., the commercial organization of medicine. It is safe to say that any solution of this nature would be unsatisfactory and repugnant to the medical profession in spite of the fact that the profession itself is composed chiefly of individual entrepreneurs who render services for profit. A more cogent objection is that the real economic problem would not be met for the simple reason that a large majority of the population are unable to pay for adequate services at any reasonable cost unless they have accumulated sufficient reserve funds. Furthermore, the signal failure of business methods to solve other problems of rendering services on a universal scale dampen whatever enthusiasm one might muster for this alternative proposal.

The solution proposed in the third direction, public medicine, is regarded as repugnant by many and as impractical by others. It is, in effect, being tried in Russia, and, although some think that ultimately it may be the wisest solution, it is obvious that it would not be possible for a long time in the United States. The fact that certain types of medical services are being gradually assumed by the public in this country because they are too expensive for individual provision or because they have for their primary purpose the control of infectious diseases, does not, I think, give us any warrant for concluding that "state medicine" or complete public medical service, is a feasible solution.

The fourth proposal, compulsory health insurance, even if put into effect upon a larger scale than in Great Britain, Europe or Japan, could solve only a part of the whole problem for the simple reason that it can include only persons able to pay the premiums which would be required to meet the costs of adequate care.

A Pragmatic Approach to the Problem

There is, of course, no one solution. It seems to me that *the needs of the situation must be met by a combination of methods.*

Those who compose our well-to-do class can continue to purchase the medical care to which they are accustomed and the physicians who serve them can reap the benefit of an economic system which permits the concentration of purchasing power within that

class. I am not here to argue for or against the existence of such a class; that question is outside the bounds of our discussion. We accept the fact, so far as medical care is concerned, as an existing condition and recognize the importance of continuing private purchase of medical care for this class.

Those who are too poor to pay for medical care must be *given* medical care; the only change in the present situation would be the payment on an adequate basis, of physicians and others for rendering good medical care to this unfortunate class. For the most expensive services—the treatment of those afflicted with mental diseases, tuberculosis, cancer, orthopedic defects, the impairments resulting from poliomyelitis and the like—the public must assume an increasing responsibility. For this class we have public medicine now and we must have more of it.

The great majority of people—those who earn their livelihood in the American way of living and who want to pay for their medical care—are not in a position to budget individually the unpredictable costs of medical care. In almost every other unpredictable contingency the method of insurance has been applied with success in our own country. In almost every other country this method of distributing costs has been applied, in a partial way, to sickness. For this class, the principle of insurance must be combined with a program of public or state medicine. We should go beyond the health insurance systems of Great Britain and Europe which provide medical care to employed individuals only, and we should go further than to provide public medical service for infants, children, and mothers, or for tuberculosis and mental diseases. All kinds of medical care, at home or in institutions, should be provided; and those who are eligible to receive this care should include not merely those who are employed, but all persons and their families having incomes below an amount sufficient to purchase medical services in any contingency. We should leave *cash* benefits during sickness to be taken care of by unemployment or possibly by commercial insurance. But in the system which is designed to guarantee *medical* benefits no proprietary or profit-making agencies should be included and no independent intermediary should be permitted between the potential patient and the medical agencies.

In such a composite program the maintenance of the physician's professional freedom is of cardinal importance. Ade-

quate remuneration of all who render medical service is necessary. And the promotion of higher quality of medical care, the professional administration of professional personnel and activities, the maintenance of the private relationship between physician and patient, and the patient's free choice of physician are obviously essential.

The situation is one that calls for a definite program of action upon a large scale, especially in a period when the ill effects of industrial and agricultural maladjustments upon the health of many will become manifest. We are not dealing with a matter of minor importance. Nothing less is at stake than the public health itself which, as Disraeli said many years ago, "is the foundation upon which rest the happiness of the people and welfare of the state." The end of any effective attempt to solve the problem before us should be nothing less than to make it possible for every person to obtain such medical care as we now know how to render. Only in this way can the public needs for medical care be met.

I would like to close these remarks upon the same note with which I began them. There *is* a reasonable approach to a solution, provided we abandon a policy of timid *laissez faire* and complacent contentment, refrain from befuddled discussions of political theories, appraise and face the needs squarely, and seek a solution in a common sense and practical way. It is possible to avoid unsuited and abhorrent commercialism on the one hand and untried experimentation in public operation of medical practice on the other. In facing a problem which concerns the health and happiness of the entire population, it is perhaps not impertinent to suggest that the time has come when we should cease to listen to any except those who are willing to think about the matter dispassionately, and, it might be added, unselfishly. No one, unless he is hopelessly timorous or narrow-minded, should refuse to consider, frankly and without prejudice, any procedure, no matter how radical it may seem at first glance, which can be utilized in dealing with a problem of such great magnitude.

THE MEDICAL PROFESSION AND THE PUBLIC. HISTORICAL DEVELOPMENTS. EUROPEAN EXPERIENCE IN MEDICAL ORGANIZATION

By HENRY E. SIGERIST, M.D.

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When a community finds itself supplied with a sufficient number of physicians, when the cost of medical care is low, and the majority of the members of this community possess sufficient wealth to purchase the services of a doctor, no need for medical organization will ever be felt. The physician will practise his art as a craftsman or as a member of a liberal profession, and will make a sufficient living without great effort. The community, on the other hand, will obtain the medical care it wants without great sacrifice.

This situation, however, is immediately changed, as soon as the doctors are scarce, or as soon as their service becomes, for other reasons, unobtainable to large parts of the population. In such cases some kind of organization will have to be created; at least in such societies as have recognized that good general health conditions benefit the individual, that the prosperity of a commonwealth largely depends on the health of its citizens, and that the community as such is responsible for the welfare of its members. This may not have been recognized in many Eastern countries, where the sick man is often left unattended to his fate. In our occidental world, however, the importance of medicine for the community has found an early and unmistakably clear expression in Plato's "Republic."

The Greek world in the fifth century B.C. suffered from a serious lack of physicians. Most towns had no permanent, no resident physician. Medical care was given exclusively by wandering doctors who, like other artisans, practised their craft while travelling from one place to another, knocking at the doors, offering their services. If the business conditions seemed favorable, if

many people were sick, the doctor rented a shop, settled down for a while until improved health conditions drove him away to another town. A man falling sick in such a place always ran the risk of being left without any medical care. Larger communities, therefore, endeavored to secure for themselves the permanent services of a physician and the only way to attract a physician and to persuade him to settle down definitely, was to guarantee him a minimum income regardless of the amount of work he would have to perform. The doctor, in other words, was salaried, was a municipal physician, his salary being raised by a special tax. We do not know what this salary was; probably not very much. Although such a doctor had to give free medical care to all the members of the community he was allowed to accept gifts from grateful patients, and in this way undoubtedly made quite a decent income. To obtain such a position was the ambition of every Greek doctor.

Here we have a first attempt at medical organization, and at the same time a first form of state medicine.

In ancient Rome, in the early days of the republic, there was no medical profession at all. Sick people were treated by magical and religious procedures, and the pater familias, men of the type of Cato, knew how to deal empirically with the more frequent diseases, and knew how to handle a broken limb. Sometimes they had slaves who were skilled in the art of medicine. A good price was paid for such a slave, as much as for a eunuch.

Attracted by the great opportunities Greek physicians, among whom were many adventurers, began to immigrate. Their number increased from century to century, and imperial Rome certainly could not complain of a lack of physicians. At the time of Galen (second century B.C.) there were innumerable doctors in the *urbs,* representing all schools, and fighting each other in ruthless competition. We do not find any trace of organized medicine. The poor parts of the population probably resorted to cheap doctors or quacks in case of illness. And we must not forget that under the prevailing patriarchal conditions a large number of people, slaves, liberti, parasites and other categories of paupers, were a part of the household of wealthy citizens. To take care of them was not only a duty but was economically sound, for a slave, after all, had a cash value. We know that special *valetudinaria,* slave hospitals, were established in the large rural estates

by the landowners, and this was done for purely practical and economic reasons, just as the military hospitals were erected on account of practical considerations.

It was Christianity that brought a new attitude towards the sick man, giving him a preferential position in society, declaring that disease, suffering at large, was grace, a blessing of God. From the fourth century on to our day, charity institutions have given their attention to the sick man, who for economic reasons was unable to take care of himself.

Outside the Christian world, in India, similar institutions were created at an even earlier date, but the underlying motives were different. It was not charity but compassion that drove Buddhist society to nurse suffering fellow-creatures, man and animal.

Charity, however, undoubtedly was a poor form of medical organization. There was a great deal of uncertainty, as it always depended on the general economic conditions, and the moods of the wealthy people. It always suffered from the contradiction that help was most badly needed in time of economic disturbances, when funds were unavailable.

Charity, furthermore, is unworthy of man, is degrading and demoralizing. Some other kind of organization, therefore, had to be sought for, giving help on the basis of mutual insurance. The roots of these organizations had to be found in the Roman *Collegia,* particularly the *Collegia Tenuiorum*, which later were called *Collegia Salutaria.* Their chief purpose was to provide a decent burial for the members, who paid an annual contribution towards this. In many textbooks, we still find that some of these *Collegia* also provided medical care for their members, so that these *Collegia* would have to be considered as the first sickness insurance funds. This, however, is not correct. I investigated the question,* and found that such a statement was based merely on three inscriptions which could not give any evidence whatever that medical service was given through these *Collegia.* The fact that physicians were occasionally members of such societies does not prove anything. Medical care given on the basis of mutual insurance is encountered first in the mediaeval guilds. Wealthy guilds sometimes had their own hospitals, others paid a regular fee to a cloister hospital, which consequently had to admit the diseased

* "Kassenärzte in Altertum?" *Mitteilungen zur Geschichte der Medizin und der Naturwissenschaften,* Bd. XXV, Nr. 2, 1926, pp. 65–67.

members of the guild. Death benefits were given to the relatives of a deceased member. In many guilds the apprentices had their own organizations, and kept special funds that enabled them to help out a member who had gotten in need through sickness or other troubles.

Absolutism destroyed the autonomy of the guilds, but preserved their welfare institutions which, for instance, were given special official recognition in 1794 in the Prussian *Landrecht*. Other vocational groups, which were particularly subjected to danger in their work, had similar organizations. The miners had their fraternities, the sailors were organized, the employer of servants was made liable for their welfare.

In this way, at about 1800, certain vocational groups had an extensive sick-benefit system. But at that time a new class began to take shape, which had no history, and therefore no traditional organizations—the industrial workers. In case of sickness, charity institutions had to take care of them. Their number increased from year to year, and events like the cholera, which in 1831 began to ravage the European countries, drew the attention of society to the fact that the health conditions were appalling. A result of this was the Public Health Act in 1848. The sanitary conditions were improved, and yet, the ever-increasing number of indigent workers created a strong need for some kind of medical organization.

A very interesting experiment was tried in the German duchy of Nassau. A bill, passed on April 1, 1818, established a complete system of socialized medicine in the whole territory. Twenty-eight medicinal districts were established, each numbering from nine to twenty-one thousand inhabitants. In each district, the medical service was given by one head physician (Medizinalrat), two medical assistants, and one or two helpers (Medizinalakzessisten). The physicians had to wear a uniform, and were salaried. They were entitled to have private practice besides, and could make an additional income in this way. The doctors' salaries were based on a special tax, the indigent population being tax-free, while the well-to-do people were divided into two tax-classes, according to income and fortune.

Towards 1848 the necessity for organizing medical service on a large scale was felt all over Germany. New medical societies were founded, and discussed the problems of the day most eagerly.

The leader in this reform movement was the pathologist and anthropologist, Rudolf Virchow, who founded a journal, *Die medizinische Reform,* devoted to these problems. The guiding principal in all these discussions was that charity should not be taken into consideration, that it was organization of medicine that was wanted—a system that would give a right to medical attendance to everybody.

The revolutionary movement of 1848 broke down, and was followed by a violent reaction. Some of the men most active in this movement emigrated to America—men like Abraham Jacobi, who became leaders in the medical profession in this country. Nothing was done in Germany until 1881. An attempt on the life of the Emperor Wilhelm I in 1878 resulted in a bill outlawing the social-democratic party. Bismarck, however, felt that prohibitions could not stop so strong a current, and endeavored to remove the legitimate causes of socialism by establishing a system of social insurance. A message from the Emperor on November 1st, 1881 became the *Magna Charta* of German social policy. In 1883 a bill was passed establishing compulsory health insurance for large parts of the population. The workers were suspicious, for they felt that this insurance policy was competing with their trade union movement. They recognized—and they certainly were correct in doing so—that the new insurance was shifting the entire burden onto their own shoulders. It is obvious that whether the insurance premium is paid by the employer or the employees makes no difference, the premium in any case having to be considered as part of the wages. For the community, insurance undoubtedly is the cheapest way of taking care of the indigent sick, as it obliges him to pay the costs of the service given to him.

The German example was followed by Austria in 1888, by Hungary in 1891; and after 1900 nearly all the European countries established some kind of social insurance. All these had the great advantage that they could build upon the German experience, and could avoid the mistakes that had been unavoidable in first attempts of this kind. It is impossible for me to discuss the different European systems of insurance. The figures are easily available in numerous publications, and can be found very conveniently in Sir Arthur Newsholme's four volumes. In the following paragraphs I will restrict myself to describing some aspects of the German development.

In 1885 four million people were insured against sickness, accident, or invalidism. In 1928 there were more than twenty-two million insured. The rate increased from 9.16 to 33 per cent, and today more than 50 per cent of the entire population are insured in one way or another. The question now is, how was the physician affected by this development? The new insurance, first of all, meant an increase in work, therefore also increase in income. The result, therefore, was a large increase in the number of physicians. In 1875–88, the population increased by 9.7 per cent, the number of physicians by 15.4 per cent. After the introduction of social insurance, from 1887–1898, the population increased by 14 per cent, while the number of physicians increased by 52.2 per cent. In 1887, there was one doctor to 3,000 inhabitants; in 1931, one to 1,500 inhabitants.

Another problem was, how to fit the physician into the new system. The simplest and most logical way would have been to appoint physicians on a salary basis. This was done occasionally, but the population insisted on being able to choose a physician at will. An unlimited choice, however, was impossible, and the sickness funds had no unlimited resources, and would not have been able to pay fancy fees. A compromising solution was found, which today is the rule, namely this: the administrators of the funds made contracts with the physicians willing to work according to a definite tariff. They entered into contract, as a rule, with one physician for every 1,350 insured, or for 1,000 insured plus their family members. In this way, today more than 30,000 physicians—and this is the great majority of all German physicians—are working in coöperation with the sickness funds, and the population has practically a free choice of physicians.

In the beginning there were endless conflicts between physicians and sickness funds. The sickness funds were private corporations managed by representatives of the employees and employers. There were no state regulations as to the relationships between the physicians and the funds. The number of physicians increasing tremendously, the competition became more and more serious, and the physicians underbid each other frequently. In 1901 the Hartmann Bund, an association of physicians organized after the pattern of a trade union, was founded. It represented the physicians with the funds, establishing definite forms of contracts, so that today the physicians are all working under the same contract, and cannot underbid each other any longer.

Sickness insurance, as it developed in Germany from 1881 on, undoubtedly had definite disadvantages. In an endeavor to preserve the old form of relationship between physician and patient within the new social organization, the physicians were remunerated according to the work done, and therefore had to itemize their bills. The funds, on the other hand, having limited resources, were compelled to control these bills, and therefore the doctors' doings. But they felt that they had to control the patient as well, in order to avoid abuses. The result was a heavy bureaucratic machinery.

On the other hand, the advantages of sickness insurance for the people's health undoubtedly were tremendous. The insurance, first of all, made the working classes health-conscious. It gave them an opportunity to obtain the best possible medical care whenever it was needed, without delay, and regardless of their economic status. It relieved them from the economic menace of sickness, and relieved them from the humiliation of accepting charity. They got the medical service they needed, but they had paid for it, and had a right to it. It has repeatedly been pointed out that the average number of days of sickness has increased enormously since sickness insurance was introduced. While in 1888, one hundred insured were ill on an average of 547 days a year, the number increased in the following way: 1913, 856.6 days; 1924, 1,084.5 days; 1925, 1,250 days a year. This does not mean that the population is less healthy, or that there is malingering. It is not that the days of sickness have increased, but the days of treatment. Many illnesses that had gone untreated formerly, today are given medical treatment in time, preventing fatal consequences. The general health conditions have undoubtedly improved tremendously, and this is illustrated by the fact that shortly after a lost war, famine, revolution, inflation, and all the disturbances of a post-war period, the German health conditions were just as good as in the best situated, victorious countries. It is further illustrated by the fact that the health conditions are better in the highly industrial centers than they are in the rural districts.

The German sickness insurance is far from perfect. It could be greatly improved, as it no doubt will be. Deficient as it may be, it has served the people's health well for half a century, and no European country that has adopted a sickness insurance plan could ever afford to abandon it.

CANADIAN AND BRITISH EXPERIENCE IN THE ECONOMICS OF MEDICAL PRACTICE

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The economics of medical practice are concerned with two problems, the first having to do with the securing of a fair remuneration for service given by the practitioners of medicine, and the second, which is really a part of the first, the problems arising out of the payment of this reasonable remuneration by the public. It is from these two points of view that I shall present what appear to be interesting Canadian experiences, and indicate some effects of British experience upon Canadian thinking and planning.

Canada is administered under a written constitution known as The British North America Act, and in Canada we do not rejoice in a supreme court to interpret this agreement of our forefathers in the light of changing conditions. According to the British North America Act, things medical, outside of a very restricted field, belong to the provinces as rights or obligations, depending upon how they are viewed. There is nothing to prevent the Dominion Government from making grants of money to the provinces for services which are accepted provincial obligations. This has been done in the matter of Old-Age Pensions, which are subsidized up to seventy-five per cent by the Dominion, in those provinces which have inaugurated an old-age pension scheme, but the Dominion cannot force any province to enter into the scheme. Nevertheless, it is inevitable, under our constitution, that whatever may be done to modify or change the present system of medical practice will be essentially provincial in initiation, development and control, even if the Dominion Government were to make financial contributions.

Canada falls into certain natural divisions. In the east are the three maritime provinces, with a population of 1,009,103, which is about ten per cent of the total population of Canada. These provinces are essentially rural, with fishing as one of the

major industries. They enjoy a more equitable distribution of wealth, and the people are characterized by a spirit of independence, except in a tendency to feel that maritime rights have been neglected.

Quebec is predominantly old France in civilization and attitudes. There you find the church in a dominating position, with education conducted on a religious basis in Protestant and Roman Catholic schools, and, strange to say, Jews are Protestants for purposes of education! The spirit of private as against public initiative and responsibility holds fast in Quebec, not only in business, but in education and in social work. Wealth is in the hands of the few.

Ontario, the largest province in the Dominion, has developed a real liking for public ownership. The public of Ontario expect their local and provincial governments to do things and to do them well. This attitude is evident in the public services and has had a definite influence upon public health and social welfare.

The three prairie provinces are as refreshing as are the breezes which sweep across them. Unhampered by traditions and full of optimism, they breed the progressive, if not the radical, in politics and other fields. British Columbia, on the western coast, is perhaps equally progressive, but displays an outward calm and dignity. The population of British Columbia is well-seasoned with old-country folks, who produce the anti-this-and-that; they are in the new world and are yet not of it.

The medical profession of the various sections of Canada reflect the general attitudes of their environment. It is to the west we turn for the more radical outlook and for progressive developments; the farthest east is most content to continue as of old, and in the central section, we find the moderates, with a touch of the progressive spirit in Ontario, and in Quebec a turning to France, by the French-Canadian majority, for guidance.

In Canada, the practice of medicine has developed along individualistic lines. The individual decides to study medicine; later, he selects the field of medicine in which he will practise and his location for practice. No control of licence to practise exists beyond the test of examinations and no province has exercised any control over the number of practitioners licensed. The licence is for the lifetime of the practitioner, provided he does not transgress the Criminal Code, under which circumstances his licence may be revoked.

Alberta is the only province which has provided legal machinery for the designation of specialists; for one reason or another, this has not been used to any extent. Following British precedent, under the initiation and guidance of the Canadial Medical Association, in the year 1930, the Royal College of Physicians and Surgeons of Canada came into being. As a new organization, it has certain weaknesses, but from now on, all new fellows will be admitted only upon examination, so that, in the course of a comparatively few years, fellowship in the Royal College will, for the Canadian public, designate the qualification of specialist.

Under the British North America Act, the provinces are responsible for the medical care of indigents. In general, the provinces have made some provision for the medical care of this part of their population. Usually, this has been in the nature of a grant to hospitals on a per caput per diem basis for hospital maintenance, not including fees for medical service. The responsible authorities and the public in Canada have come to take it as accepted fact, that the medical profession will give their services, without charge, for the medical care of the indigents. Reading the Municipal Act of Saskatchewan, you would conclude that this was not the case in that province. We are informed that they "are still operating from the medical viewpoint as if there had never been a Municipal Act." The Public Health Act of Ontario requires the appointment of a medical practitioner for the care of those "unable, through poverty, to pay for the necessary attendance, and who are not cared for in a public or private hospital." Many municipalities have not carried out this clause of the Act, and the medical care of the indigent is left entirely to the local medical profession.

To pass laws is one thing; to carry them out is another, and when the decision is left to the municipality which must pay the cost of enforcement, there is more than a tendency to do nothing, with the idea that the province or the cities will do it in some way.

During the time when most medical practitioners were family doctors, the number of indigents was comparatively small, and the burden on any one doctor was not severe. In the larger centres of population, the family doctor has been replaced, to a considerable extent, by a group of family specialists, who are called by the family according to the age of the patient or the part

of the body which appears to be diseased. Motor cars and better roads have had a tremendous influence in modifying medical practice. The area of practice is thereby increased, and the public are able to go here and there for medical care. An increased industrialization has resulted in a higher percentage of the population's being indigent at times, as a result of unemployment, accidents or sickness.

These and other factors have brought an ever increasing number of persons to be cared for, by the medical profession, as indigents. It may be said that for some years before the depression, the Canadian medical profession were becoming restless under this burden and irritated by the acceptance, without appreciation of their assumption of what was a state responsibility. The position of the indigent has not been a happy one, because he had no rights and he must, perforce, take what he could get.

The onset of the depression accentuated this evil, and in sections of western Canada, created a crisis. The attitude of governments was revealed when the Dominion Government, coming to the aid of the provinces, limited the federal contribution to a share of the cost of food, shelter and clothing.

At this time the Canadian Medical Association waited upon the Prime Minister and, speaking on behalf of the profession, urged the fairness and desirability of including medical care as one of the items of relief. The Prime Minister admitted to the representatives of the Canadian Medical Association that the doctors should be paid, but stated that the provinces should do this. The provinces, with the exception of Ontario, evade the issue on the grounds that they will act only if the Dominion will pay their share of the costs. The important point in all this is that governments, while recognizing in theory that medical care is one of the essentials of life, leave the cost of this burden to be borne by the medical profession alone instead of distributing it over the whole population.

In this, Ontario is an exception. By Order-in-Council in October, 1932, the government of Ontario agreed to pay two thirds of the cost of medical care for those on unemployment relief, the municipality to pay the other third, and the physicians of the province agreed to accept fifty per cent of the prevailing medical tariff. The weakness of this plan is that the municipalities are left to determine whether they will accept the govern-

ment's proposal, and many of them evade their whole responsibility by doing nothing. Where the scheme has been applied, it has worked well.

Outside of Ontario, a very few municipalities have undertaken to pay something toward the medical care of the unemployed.

The medical profession of Winnipeg have pressed energetically to secure payment for medical care of the unemployed, refusing to give service except in cases of emergency, but so far, they have not had their requests granted.

The acute situation arising out of the depression has brought about a fairly general acceptance of the idea that there must be some change in the provision of medical services. This idea was firmly rooted in western Canada before the depression, had many followers in Ontario, a few in Quebec and practically none in the east. At present, the east is only slightly interested, Quebec is displaying much more concern than formerly, and Ontario and the west are, I believe, definitely convinced.

There is evidence that the public, as a whole, believe that the physician should be paid for his services. The people of Winnipeg and the newspapers of that city have viewed sympathetically the efforts of the medical profession to secure payment for service to the unemployed.

The community do not expect that nursing care will be provided for the indigent by the nursing profession. In Canada, we have the Victorian Order of Nurses for Canada, a bedside nursing service organization, which, through their local branches, serve one third of the population of the country. The communities served undertake to support their branches through voluntary contributions or by means of a grant from public moneys. It would appear logical to extend this principle to embrace all medical care.

Despite the fact that the private practice of medicine has continued in much the same fashion for years, nevertheless, a number of changes have taken place in Canada, with the result that, at present, organized medical services, under private or governmental control, are more widespread than is generally recognized.

The care of those suffering from mental disorders, who require institutional facilities, has been accepted as a direct responsibility by provincial governments. With the exception of

those in the Province of Quebec, mental hospitals in Canada are owned and operated by the provinces, with full-time medical staffs. This field is being extended through the provision of mental hygiene clinics, conducted in neighbouring areas by the staffs of the mental hospitals.

The care of the injured workman, at the expense of the employer, through a form of insurance, is provided for in all provinces excepting Prince Edward Island. Most provinces have their workmen's compensation act, administered by a commission with a state insurance fund. The fees for medical care are fixed by the commission, and so the old right of the physician to arrange his fee with his patient is overthrown.

The Dominion Government provide medical care for war veterans (pensioners), conduct their own hospitals or pay for service in privately owned hospitals. Indians on the reservations, as wards of the government, lepers and sick mariners are provided with medical care.

Public health services in Canada have developed along generally accepted lines. We have been greatly influenced by health practices in the United States, but we have copied such desirable British practices as security in tenure of office for the medical officer of health and the requirement that he be a physician. We have not advanced to the point which they have reached in Great Britain of requiring that reasonable salaries be paid for official medical posts, holding what amounts to a boycott, through publicity, as a threat to secure action from recalcitrant official bodies. The public health development throughout Canada is very uneven. The larger centres of population are fairly well organized. The Province of Quebec has gone farthest in rural health work and, last year, passed a law which, in effect, assured the continuance of all existing rural health units, which now cover half the province, and which gave to the province authority to create new units when it appeared desirable to do so. Thus, the rural areas are compelled to tax themselves for local public health services.

The diagnosis and treatment of communicable diseases are recognized as being part of the public health programme. In this group are included tuberculosis and venereal disease. Facilities for the diagnosis and treatment of cancer are, or are being, organized. Public opinion is forcing governments to take action

to provide medical services, but, up to the present, practically the only action governments have seen fit to take is an extension of their public health services, usually on a clinic basis.

In 1932, Canadians paid $6,008,526 in premiums for personal insurance against accident and sickness. Approximately, 68,000 Canadians paid $456,000 to fraternal societies for sickness and funeral insurance in 1932. These figures indicate that a considerable number of people, on their own initiative, seek the security of insurance to provide themselves with medical care.

As we move up the economic scale, we realize that while an indigent may be defined as a person who is needy or poor, it is difficult to give a definition that will be fair in practice. A person may be indigent from the point of view of ability to pay for medical care, and yet be earning money. In Canada, there are only about 135,000 individuals paying a Dominion income tax, and of these, in 1932, sixty-seven per cent lived in Ontario and Quebec, and they paid eighty-one per cent of the total tax collected. In Canadian manufacturing industries with 91,243 salaried employees, the average salary, in 1927 was $1,899. The average wages, in 1927, of the 566,780 employees was $997. At all times, whether good or bad economically, the average male wages are between $927 and $1,024.

The 1931 census shows a total of 2,566,001 wage-earners. Of this number, 112,647, or one out of twenty-three, lost time averaging over twelve weeks on account of illness. This suggests that only the more severe illnesses were reported to census enumerators.

The position of the wage-earners, taken as a group, is that they are unable to cope with severe, prolonged or chronic illness, and that the costs of minor illness impose a hardship.

Western Canada has made the most novel contribution, in Canada, to the solution of the economic problem of medical care for the so-called middle class.

In the Revised Statutes of Saskatchewan, 1930, Chapter 106, Section 175, An Act Respecting Rural Municipalities, we find: "The Council may, at a regular meeting or at a special meeting called for the purpose, resolve to submit to the electors a by-law empowering the Council to engage the services of a legally qualified medical practitioner for the municipality, at a salary not to exceed Five Thousand Dollars per annum, and may submit the same to the electors for their approval."

In June, 1933, thirty-seven rural municipalities in Saskatchewan were being served by a full-time municipal physician, over thirty by a part-time municipal physician, and nine municipalities had passed the by-law, but had not made the appointment.

Manitoba has five rural municipal physicians and Alberta three, under somewhat similar laws.

It is noted that the system has not been discontinued in any municipality where once it has been started. A variety of views may be obtained as to the value of this plan. There is a lack of central control, and the individual physician is left to bargain with the municipality. Control of the terms of appointment and supervision of service are necessary, both for the public and the profession. The independence of municipalities is a stumbling block which will have to be overcome to develop a province-wide service, which is the obvious thing to do if standards of service are to be achieved.

Saskatchewan has made the most complete provision for sanatorium care. Under the 1929 amendment to the Sanatoria and Hospitals Act, free treatment was made available for the tuberculous in Saskatchewan. The provincial government pay one dollar per patient per day, and the balance of the operating cost is paid by the rural and urban municipalities on the basis of their equalized assessments.

Saskatchewan has experimented in Maternity Grants. Beginning in 1920, the province of Saskatchewan granted $25 to assist expectant mothers. The number increased year by year, until in 1931, the sum of $64,116 was given to 3,020 mothers. Of this sum, $26,465.50 was paid to 1,766 doctors for their services. The Maternity Grants were discontinued in 1932, owing to the depletion of the provincial treasury.

In Alberta and Saskatchewan, we find a hospital development known as the Municipal Hospitals of Alberta and the Union Hospital System of Saskatchewan respectively. The principle is that when the required majority is given the project by vote of the people living in the one or several municipalities to be served, the communities concerned are committed to tax themselves to pay for the erection and furnishing of the hospitals. Saskatchewan has an optional provision whereby, after a majority vote of the rate-payers, the rural municipal council will pay the hospital accounts of the rate-payers. Alberta has over twenty municipal hos-

pitals, and Saskatchewan has twenty union hospitals, and in seventeen of the rural municipalities associated with the scheme, hospital treatment is provided at the expense of the community. The average cost per patient per day in 1932 was $2.53.

Canadians have been thinking for some years about health insurance. No doubt, we have been influenced by our contact with the motherland, where we have seen health insurance in practice. In British Columbia, in April, 1929, the appointment was made of a Royal Commission on State Health Insurance and Maternity Benefits. The conclusion of this Commission was expressed in their Final Report, dated 1932: "Finally, we would say that our recommendations for the early establishment in British Columbia of a suitable compulsory health insurance plan, including maternity benefits, are the result of the members of our Commission having become thoroughly imbued with the momentous and incalculable beneficial effects which kindred schemes in the Old World are producing in alleviating for the poorer classes the dread incubus of sickness costs, and thereby reducing premature mortality and raising the general standard of health among the masses."

The British Columbia Medical Association presented their views to the Commission. They advocated a system of compulsory, contributory state health insurance, providing a complete medical benefit with freedom of choice of doctor, all legally-qualified medical practitioners being eligible to participate in the scheme. They advocated payment on a fee-for-service-rendered basis.

Recently an election was held in British Columbia, and the new government are pledged to introduce legislation to make effective the report of the Royal Commission.

An investigation into systems of state medicine was made in Alberta in 1929, resulting in the setting-up of a new Commission which made an interim report, in 1933, stating: "Adequate medical services for all the people of Alberta can only be secured through the operation of a contributory health insurance scheme."

An interesting statement in their findings reads: "Commission wish to go on record as in favour of an adjustable schedule providing a more equitable ratio between the fees for medical and for surgical services, and between fees for general and specialized services."

The College of Physicians and Surgeons of Alberta, in present-

ing their views to the Commission, stated what the medical profession of Canada agree upon, namely: "It is nevertheless very important that, in facing the whole problem we shall not allow ourselves, as members of the community or as members of the profession involved, to be forced by the exigencies of the present crisis to formulate and seek to adopt any scheme which, while acceptable at present, would not be in the best interests of all concerned under more normal economic conditions." That is a danger which we are trying to avoid, keeping clear the distinction between emergency and other measures. The group then go on to say that there is, among the profession of Alberta as a whole, a wide divergence of opinion, but that "In our opinion, a considerable majority of the profession in this province would welcome a scheme of State Health Insurance which would include certain important provisions." These provisions include the right of choice of doctor, payment by fees for service rendered, a complete medical benefit, and no municipal doctors excepting in areas with a very scattered population. The government of Alberta have expressed their intention to introduce health insurance legislation this year, based on a per caput cost of $13 a year.

At the Annual Meeting of the Saskatchewan Medical Association in 1933, a Special Committee on a System of Health Insurance for Saskatchewan recommended that Health Insurance be the basis for study with others interested in the provision of adequate medical care. The committee submitted as principles, from the medical point of view, that the scheme should be compulsory and contributory, and that it should cover the whole province, allowing freedom of choice of physician, a complete medical benefit, and payment for service rendered.

The College of Physicians and Surgeons of Manitoba and the Manitoba Medical Association, in 1930, appointed a Joint Medical Service Committee to study state medical services. Their findings were practically those of the British Medical Association as expressed in the latter's Proposals for a General Medical Service for the Nation.

The Province of Quebec Medical Association appeared, in 1932, before the Quebec Social Insurance Commission, a body appointed to consider certain subjects, including sickness insurance. It had been impossible to secure time for the medical profession of

the province to study the question, but the principle of health insurance was upheld. Preference for the French plan of direct payment of the doctor by the patient, the latter to be reimbursed subsequently, was expressed.

The Quebec Social Insurance Commission recommended, in 1933, that the system be adopted gradually, beginning with the formation of societies to receive voluntary contributions for hospital care. "As a result of this experience, the public authorities will be able to decide, after an interval of five years, whether it is advisable to institute obligatory insurance."

The Canadian Medical Association have had the subject of health insurance brought to their attention from time to time. Certain studies were made, and finally, in November, 1932, the Executive Committee instructed "That the Committee on Economics be authorized to prepare a plan or plans for health insurance, and that these be passed to the various provincial associations for their consideration, criticism and suggestions." This work is well in hand, being time-consuming because of a scattered committee which is required to make the membership Canada-wide. The Canadian Medical Association have not expressed any desire or intention to press any scheme on the attention of any government. What is proposed is a statement of what the Association consider essential in any scheme, so that they may have available, if and when required, the considered views of the medical profession on the subject.

I believe that the medical profession have been impressed by certain British experience, which has made them consider what stand they should take. First, the Royal Commission (England and Wales) on National Health Insurance, in 1926, reported: "We are convinced that National Health Insurance has now become a permanent feature of the social system of this country and should be continued on its present compulsory and contributory basis."

Then, in 1930, came from the British Medical Association their proposals for a General Medical Service for the Nation. If you will read Sir Henry Brackenbury's address in the *British Medical Journal,* issue of March 4, 1933, you will understand that these proposals voice the opinion of the great majority of British medical practitioners.

Briefly, what is recommended by the British Medical Associa-

tion is this: that the present Health Insurance scheme be extended to (*a*) include dependants of insured persons; (*b*) widen the scope of medical benefits; (*c*) provide for the optional inclusion of indigents.

Considering their years of experience with Health Insurance, is it to be wondered at that we regarded this as significant? It appeared to us that the medical profession of Great Britain had concluded that, with all its faults, health insurance is the best plan available to provide an adequate medical service for the nation.

Just how far the medical profession of Canada would willingly go, I do not know. I believe that the vast majority are of the opinion that a change is coming, and a not inconsiderable percentage want a change. I believe the day is past when the medical profession will assume all the responsibility for the medical care of indigents, and the public are going to insist upon having medical care arranged for on some basis whereby they can pay for it without being unduly burdened.

THE GENERAL PRACTITIONER—HIS PLACE IN THE MEDICAL PROFESSION

By ROGER I. LEE, M.D.

(*Boston, Mass.*)

When one thinks of the general practitioner and his place in the medical profession, one is strangely and strongly reminded of some lines of Rudyard Kipling about Tommy Atkins. There is a good deal of "But it's 'Thin red line of 'eroes' when the drums begin to roll" and "Savior of 'is country" but also unfortunately much of "Tommy, fall be'ind," all of which is as applicable to the general practitioner as to Tommy Atkins. There has been a great deal of adulation and glorification of the general practitioner in recent times. Most adults like to recount tales of general practitioners that they knew in their childhood and youth. Many of these shadowy figures of general practitioners attain deservedly a grandeur and a romance which is splendid. The usual ending of these stories is the sad state of affairs of today, when, alas, there are no general practitioners of the old school, no doctor's saddle bags, no doctor's gold-headed cane, no doctor's frock coat. And the cynic might well add, no telephone, no automobile, no asepsis, no anaesthesia. Indeed, in those days of high infant and maternal mortality, of emetics, purges, blood lettings, blisterings, cuppings and poultices, patients also had to be cast in heroic mould.

However, even in these days, there are men who are trying to be general practitioners. These practitioners tell of their patients going to various and sundry so-called specialists, perhaps on as important a recommendation as that of the cook. Very often the advice of the general practitioner is not asked in regard to important medical procedures. Somewhat absurdly, sometimes one finds that a given patient, who of course has his own oculist and dentist concerning whom he would not consider advising with his general practitioner, consults a dermatologist and a nose, throat and ear specialist of his own choosing and furthermore may be under a diet from another specialist, may take certain exercises

from an orthopedist, and perhaps get some advice concerning nervous debility from another specialist and then have colonic irrigations on his own. This is no exaggeration, as it occurs over and over again. But it is the general practitioner who is called at inconvenient times and at night or for minor ailments.

It is true that with the development of specialism in medicine many of the stronger personalities among the doctors tend to seek out some of the specialties, let us say surgery, for example. Of course, that fact eliminates a certain number of colorful individuals from the so-called general practice of medicine. On the other hand, it is also true that frequently the less able and less vigorous of the medical graduates find the general practice of medicine much too robust and much too responsible for their timid souls, and they tend to drift into the specialties, particularly those which do not demand strenuous work or heavy responsibility.

The profession of medicine makes a strong appeal to a definite proportion of young men. Of course, the road is long and expensive and the final returns in material things is not great. As a result, the impatient, the avaricious and the casual students usually do not continue their medical studies. Many youths who mildly fancy that they might like to study medicine are deterred by the preliminary requirements in college. Nevertheless, an adequate number of able and vigorous minded boys of varying degree of personality continue to seek admission to our medical schools. These boys seem to represent a good cross section of college youths, and they seem to have more idealism than the average. I go into this at some length because it has so often been said that due to many factors and particularly due to the tremendous requirements in time and money, the very ambitious boy, from a family of only moderate means, rarely goes into the practice of medicine, or if he does, he turns his back on general practice. Experience does not seem to bear out that entirely theoretical contention.

The general practitioner has been assailed as incompetent by certain types of medical specialists. Of course, there are incompetent general practitioners and there are incompetent specialists. There are unscrupulous members of any profession and of every walk in life. A survey of medical practice and an attempt to establish standards for medical practice led us to believe that 85 per cent of medical practice could be carried out by the general practitioner as one found illness and general practitioners in

1932. It was our belief that 15 per cent ought to be done by the specialist and would be better done by him. Of course, it is true that a certain amount of practice could be done equally well by the specialists and the general practitioner. On the other hand, there is a substantial amount of practice which is probably better done (and certainly less expensively done) by the general practitioner, particularly when he knows as he should the patient, his personality, his background and his heredity, than by any specialist.

There are those who argue that the day of the general practitioner is over. The argument is usually based on the experience of the business world. It must be admitted, however, that the arguments based upon the facts and the seeming facts in the business world are not regarded as quite so awe inspiring or compelling as they were a few years ago. It seems to me that the real points at issue are essentially two. (1) Is it possible in a restricted time, as medical education must have some restrictions in time, to prepare a medical graduate for general practice? Though it is many years since any one doctor even pretended to know all about the various fields of medicine, it seems to me that the answer must be in the affirmative, and that it is possible to prepare a youth for the general practice of medicine with the understanding that at this day and date he will be equipped to do 85 per cent of the practice and will be perfectly competent to know when, where and how to seek advice and aid in the other 15 per cent. (2) The second point at issue, which cannot be quite so readily answered, is, granted that the recent medical graduate is thoroughly competent to do general practice, is it reasonable to suppose that he can continue that competence after a few or many years of practice? No adjective is too strong to describe the march of medical progress. The late President Eliot was fond of the word prodigious and liked to refer to the "prodigious advances of medicine." Those of us who are a little gray or perhaps more than a little gray, but who consider ourselves, if not young, certainly not old and who are beginning to be a little bit sensitive as to how long ago we graduated, sometimes shudder when we think of practicing medicine with the equipment that we had when we graduated from the medical school and the hospital. Of course, there are times when we would like to junk a good many of the newer devices, but nevertheless, one would hardly venture

to practice medicine these days without the x-ray, blood chemistry or the Wassermann test. Some of us who are a bit older may pant a little when we find the pace a little hot, the ground a little rough and the walls a little high in our struggles to keep up with medical progress, but experience shows that somehow it can be done.

There are in actual practice today many general practitioners who in various ways have kept abreast of medical progress. Indeed, in spite of the obvious handicaps, many really great discoveries have been made by general practitioners. It is always reassuring and always inspiring to meet a general practitioner who has no great personal contact with his fellow practitioners, who has no intimate connection with a hospital, and who rarely goes to medical meetings, but who keeps entirely abreast of the times by reading. The problem of the continuing medical education of the medical graduate is a matter that has given great concern both within and without the medical profession. There are medical journals, medical meetings and all sorts of clinics and demonstrations at hospitals and laboratories and many other methods of graduate medical instruction with the result that depending upon the personality of the doctor it is at least now possible for him to keep himself competent in the general practice of medicine.

Although our economic ideas of yesterday and the day before are undergoing changes which sometimes seem rather revolutionary in character, and although one hesitates to speak of any such outworn economic slogan as the law of supply and demand, yet that slogan, if not taken too literally, may indicate the situation in which the general practitioner of medicine finds himself. He finds that in the last generation or so, such epidemic illnesses as typhoid fever and diphtheria have very much disappeared. In earlier days, those epidemic illnesses were in fact a considerable source of his income. He finds, furthermore, that the increased facilities of transportation, especially the automobile, while enabling him to make a wider circuit, also enable his more prosperous patients to seek and obtain their medical advice from a distance and enable the specialist from the large community to cover a really extraordinary amount of territory. Unquestionably these and other factors tend to decrease the income of the general practitioner. It is commonly said, moreover, that the medical profession is very much underpaid and that the general practitioner

is the most underpaid of all. Considerable statistics may be advanced supporting that view. The studies of the Committee on the Costs of Medical Care showed, I think, clearly that a substantial proportion of general practitioners worked really outrageously long hours and the average income was relatively small.

On the other side of the picture, however, are several rather important facts. In the first place, the general practitioner has never adequately developed the preventive side of his practice. This would include, obviously, periodic physical examinations and the administration of various protective measures to his patients. Of course, this in the end would cut down disease and his income therefrom, but it is a neglected and yet a profitable aspect of the general practice of medicine. Our studies indicated that while there was an unbalance of the distribution of the doctors in this country, yet on the whole, there did not seem to be any very great excess of doctors. Furthermore, the average age of the doctors, especially that of the general practitioners, is decidedly older, rather than younger. Then too, even in the last generation, many of the medical schools have gone out of existence. There is frequently a limitation of numbers in the first rate medical schools. Consequently the output of doctors is not running wild in the realm of overproduction about which we hear so much. Again, it seems likely that an increasing proportion of medical graduates will go into exclusively laboratory research or teaching activities and thus will not be economic competitors of the actual practicing physicians.

Decidedly more serious from an economic point of view is the attitude of the public, that is, the patients of the general practitioner. There is an increasing constant pressure on the part of the public to seek cheaper medical services. This is an entirely natural tendency and is ingrained in human psychology. Together with this is the attitude of mind that disease is an accident. For this attitude of mind the medical profession is perhaps largely responsible. The effect of this attitude of mind is not to include medical items in the so-called budgets, which are very popular nowadays, and in general to regard medical service as either a luxury or an undeserved and therefore nonbudgetable calamity. Yet, as society is now constituted, every family has a certain proportion of their income requisitioned, as it were, for illness and medical services.

The public sees no reason why, by and large, it should not utilize free or inexpensive clinics or various clinics which are so specialized that they are operated by boards of health for the benefit of the general community. No matter what precautions are thrown about the free or nearly free clinics, there will always be some abuse, and the tendency will always be to the increased utilization of any free or inexpensive clinic. We have in my community a hospital dedicated to people of moderate means. When the hospital authorities accept the sworn figures of the income tax returns, occasionally at least, the wealthy, if we may judge them by their standards of living and not by the tax returns, will be admitted and will take advantage of a considerable reduction in medical charges. One wonders, however, if it might not be well for some to sell a horse from the stables or perhaps two or three dogs from the kennels and go to a private hospital where they really belong instead of to a hospital which has very restricted professional fees for the purpose of helping the great middle class.

It is true that the doctors combat these trends, but it is also true that, by and large, the public seems to believe that the doctors are activated by selfish motives. That this conflict between the public, who are the patients, and the medical profession, who are mostly general practitioners, is inevitable and is serious cannot be denied. The outstanding medical figures can take care of themselves and need no particular help or sympathy. Neither do the doctors who practice largely or exclusively among the well-to-do merit serious consideration. They too are amply able to look after themselves and their own problems.

As a solution of this economic problem as the lay public see it, various schemes have been suggested. Usually these schemes are supposed to carry with them improved medical service. These plans are almost countless in number. In all these plans, some reorganization of the structure of medical practice is inevitable. Inasmuch as in the present structure the general practitioner constitutes the framework, usually it is his activity and his relationship to the whole structure which is altered. There is the plan for complete state medicine. The argument is the obvious one—if the furnishing of pure water is the function of the state and if the state already undertakes certain responsbilities and functions in the safeguarding of health, why not take the complete step and have the state look after all of the aspects of illness!

There are those who advocate some form of medical insurance. The obvious argument is that most individuals insure their house against fire and usually themselves against death. If the state has compulsory automobile insurance, why not have health insurance. There are many modifications of this general plan. Some would limit it to major surgical operations and hospital service. Some would have it with and without cash benefits. There is argument without end. There have been various experiences with various health insurances on a large scale in England, on a somewhat specialized scale in Germany and on a smaller scale in this country. The difficulties are as obvious as the advantages. The medical profession looks on these plans with a jaundiced eye. The possibility of state medicine always tends to make a medical society incoherent with rage. On any general plan of insurance the doctors look with much suspicion and disfavor.

Certain members of the medical profession have attempted to solve some of these problems themselves, although it must be confessed that, by and large, the medical profession has been very sluggish in attempting to find any solution to this crying problem of medical economics. There has been a considerable development of group medicine under the aegis of the medical men themselves. There have been several very conspicuous successful organizations along this line. Like many other plans, the success seems to depend far more on the personality of the participants than upon the actual organization. Some of these attempts at group medicine or clinics have by no means escaped the adverse criticism of the general run of members of the profession. However, the group medicine and the clinic plan, where it has been successful, has been peculiarly so in surgery or in some form of specialized medicine, perhaps diagnosis and general medicine in that sense, but hardly certainly as yet in the general practice of medicine. Consequently, this solution, advocated by some members of the profession and at this moment receiving a large impetus not only from the profession but also by the laity and very much on trial, does not as yet constitute the solution for the problem of the general medical care of the public and for the problem of general practice. In reality, most of the group medicine and clinics today involve only what might be called the aristocracy of the profession.

The suggestion of a guild of doctors has been made and has

been in some modification carried out on a small scale. The management and control of this guild at once presents difficulties because the doctor on his side is convinced that he ought to control it and so is the patient on his side, that is the public, similarly convinced.

Some form of contract medicine has been in relatively successful operation for a long time. By successful, I mean that they have furnished adequate medical service to a group of people for costs which seem reasonable. Most of those schemes have been in connection with industries. Of course, the plan grew up when an industry, isolated from other communities, represented a community of its own and had to furnish medical service. There is a similar development in some of the universities. Of course, the army and the navy represent typical illustrations of this type of medical practice. The plan has not been universally successful by any means. The difficulties of such plans of medical practice greatly increase with the numbers involved and with complex communities. Even in a relatively small industry, if the responsible person in the industry picked a good doctor and supported him, the plan has been often times successful within limits. On the other hand, when the manager of the industry picked someone because he was a friend of his, or because the doctor needed a job, or because he would "work cheap," the plan has been unsuccessful.

Beyond any question, the temper of the public and even the temper of the medical profession is toward further experimentation along the general lines which I have laid down. Even the medical profession has become somewhat aroused and is shaking off its lethargy and is attempting to look at this troublesome problem of medical economics as dispassionately as possible and is trying to get itself in a frame of mind that it can encourage certain experiments which it regards as consistent with the traditions of the profession.

The traditions of the medical profession run strongly and deeply. It is not the fashion nowadays to put any great value on traditions. Nevertheless, I think it is of importance as well as of necessity that the medical profession maintains in certain very tangible fashions a considerable degree of altruism and idealism. It is, I think, to the great credit of the medical profession that with few exceptions medical remedies and medical devices

have not been patented in this country. That is a problem that is hotly argued but the strong weight of medical feeling is positively against it. That is not true of the engineering or other professions. While there are many exceptions, it is, I think, to the great credit of the profession that the patient's doctor is mentioned so much less than one would expect in wills. I certainly do not assume that being mentioned in a will is in any sense derogatory. The opportunities for selfish suggestion are many to the doctor but experience shows how extraordinarily rare it is that the doctor succumbs to any such temptation. Your doctor of yesterday, and the doctor of today to a large but perhaps somewhat less extent, is an intense individualist. It is true that the hospital, the medical society, and the contacts and associations now necessary in many instances to practice good medicine has perhaps lessened this somewhat. Generally speaking, however, the doctor still regards the practice of medicine as a very intimate association of doctor and patient under the seal of privacy, and curiously enough perhaps, although the theory may be to the contrary, there is a substantial proportion of the public (that is the patients) who feel exactly that same way. In times of stress, the lay chief of an organization, the general in the army, the trustee of a hospital, the president of a great industry, often want and demand the personal services of the heads of their medical organization, rather than the impersonal, even if certified capable medical service of their own organization.

It may well be that both the doctor and the patient will change their points of view. There are already definite signs of this change. For example, many doctors function quite happily in large clinics where patients are dealt with en masse. Furthermore, there are a good many patients that are very content to go through the hands of a great many doctors in the process of securing a diagnosis. A good deal of this, however, relates to rather special problems in the practice of medicine and not to the ordinary problem of the activities of the general practitioner. But even in the great clinics, where a patient sees a large number of eminent specialists, it sometimes happens that the sole recollection of the patient as far as individual doctors is concerned is some very subordinate doctor who had no more important function than doing an occasional dressing. Then too, those unusual and specialized episodes of major operations, while

of very large importance, are relatively speaking unusual. What the actual situation requires is the care of a multitude of ailments that in some senses are trivial, but which may be very important to the patients.

In some cases it is impossible, undesirable, or inexpedient that the patient should be taken to the physician. Here again there is the economic problem. A great many hospitals and clinics are geared almost exclusively to take care of major difficulties. A poor unfortunate person with a slight cold who comes to a great diagnostic clinic would receive, of course, a careful history, careful examination by a specialist of his nose and throat, very likely with x-rays of his sinuses, and probably an x-ray of his chest. This would mean an expenditure of a great deal of time and money. Of course, obviously, a person with a cinder in the eye wants to have that removed and does not want a complete history and physical examination and most emphatically does not want to pay for the necessary time and medical skill involved in that. A complete history and physical examination is not always necessary for a sprained ankle, even if an x-ray is desirable. From the economic aspect it seems about impossible, or at least very difficult, for the large clinics as now operated to shift their gears so readily as to meet all situations of which I have outlined only a few. Very likely, however, the problem can be solved by some sort of a combination of industrial clinic and group clinic with home visiting, but much more experimentation is needed.

To my mind, the greatest asset of the general practitioner and the greatest objection to many of these complicated schemes is not the traditional attitude to the doctor or the traditional attitude to the patients who want individual service, but it is rather the principle that the patient in the last analysis is a unit and is not an aggregation of somewhat isolated segments. It seems to me that the sound practice of medicine demands that there should be some integrating force, no matter how many specialists there are. I do not much care whether you call this integrating force a coordinator, a clearing house, a traffic officer, or a general practitioner, but it seems to me that some individual has got to have that responsibility. One could repeat no end of disasters which were brought about by the fact that several different specialists were working entirely independently of each other.

Medicine is not yet an exact science. It is true that we are traveling rapidly towards that goal. Yet, in the practice of medicine there is always the personal equation. It plays a considerable part in the doctor and a much larger part in the patient. There will always be wide variations in the temperament of patients and one man's trifling discomfort is another man's bad pain and a third man's intolerable agony. The same exciting cause in different individuals may give rise to a very divergent series of symptoms. Consequently, it is of value that the doctor should have some inkling of the temperament and psychological makeup of his patient, and that, I believe, will be so to the end of time. To my way of thinking, that is the cogent reason for attempting to insist upon the retention of the institution of the family physician and of having him the central clearing house for the medical activities relating to the patients. While it is true that frquently a complete and accurate diagnosis, prognosis, and treatment may be had from the laboratory, or by scrutiny of assorted accumulated data without seeing the patient, or even by mail, I do not believe that that is or ever will be sound medical practice as a general rule. Neither do I believe that the secretary of a captain of industry can give always a satisfactory history to a medical assistant, however time saving that is to the captain of industry and to the medical chief. The uncorrelated, fragmentary reports of different doctors on the same patient will often be conflicting or misleading. Not often can all the personal equations of the patient and of the doctor be eliminated. Certainly, most printed forms which are checked tell nothing of the personality of the patient, and little of his social environment from which so many ills come. I do not believe that there will ever be any substitute for the personal interview in the practice of medicine. Perhaps some aspects of medical practice may be impersonal. Actual surgery may often be impersonal. But mostly, medical practice is personal service.

The practice of medicine is not like the operation of a department store, not on account of any sentimental distinction between a profession and a trade, but because of those personal factors that make people different from overcoats, automobiles and tooth brushes. It may well be that the economic aspects will demand a considerable change in the organization of medical practice. It may well be that certain business standards, so called, will be

introduced although I, for one, would find it extremely painful to accept the high pressure salesmanship idea and the advertising idea in medical practice. One wonders, furthermore, how much that would cost, because no money is now expended for such purposes. It is my belief, as I have indicated previously, that there must be some readjustment in the economic organization of the relation between the medical profession and the patients. I do not believe that it is necessary, wise, or desirable that that economic readjustment (and certainly not in the experimental stage) dislocate very largely the general practitioner. I believe that if the personal relations between the doctor and patient are very largely disturbed one inevitable result will be that the quacks and the cultists, who shrewdly capitalize personality and personal relations, will receive a tremendous impetus and will supply the sense of personal relationship which is now carried out by the medical profession. The quacks and the cultists will take a "hard boiled" business view of the situation. Just the same as no business man would dream of refusing to sell a fur coat to a person who had the money, neither would the quack or cultist dream of refusing treatment to anyone who could raise the money. Yet it is, I think, the basic idea of the proper relation between the medical profession and the public that a patient's circumstances should receive consideration in regard to what might be called the frills of medical attention, but not in regard to the fundamentals of medical care. In other words, it would be as if a poor person wanted a fur coat and when it was discovered what the family income was, the merchant refused to sell him the fur coat but did sell him an adequate ulster. Of course, there are plenty of illustrations of the shortcomings of this relationship at present between the public and the profession but that, I think, is the ideal and that, I think, is what is in the mind of those who are giving the whole problem serious consideration. It seems to me that irrespective of the economics, and irrespective of the precise method of payment, and also taking in consideration our tremendously urban population, the sound solution still maintains the general practitioner, in a slightly different role from what he has had in the past.

In my conception of the competent general practitioner, he will be rather more of an internist than a surgeon. And yet, the local requirements will often be the determining factor. But

many good general practitioners are lost in indifferent surgeons. Your general practitioner will develop his diagnostic skill, his ability to make early diagnoses of serious conditions. He will develop his technique in preventive medicine. By whatever means he can, he must keep abreast of medical progress. Finally, he must know his own limitations and know when, where and how to seek aid and assistance. He will himself do about 85 per cent of the medical work in his practice. He will be the clearing house for all special attention to his patients. In many instances he will solve some of the financial difficulites because he will know the financial capacity of his patients. If there are insurance plans or group plans, if he is out of these plans, he can advise his patients how best to make use of them. If he is within these plans, he can guide his patients within them. I believe that if these plans do not utilize the general practitioner in some such way as this, it will be the plans rather than the general practitioners that will fail. I believe that it is medically important to take cognizance of the personality factor in the practice of medicine and that it will always be important. I think that it makes for better medicine and the better practice of medicine. After all, our chief concern is medical service that will prevent disease, cure the sick wherever possible, and alleviate suffering. The organization to attain these ends is, of course, important, but the aims must be the chief objective.

CHANGE COMES TO THE DOCTOR

By MICHAEL M. DAVIS, Ph.D.

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"Because," wrote Franklin D. Roosevelt in 1932, when he was Governor of New York State, "large groups of the population seem unable to provide themselves with adequate medical services, the problem was of major importance five years ago. It is of vastly more importance now, because of the change in the economic situation."

In the past fifteen months, since the Committee on the Costs of Medical Care disbanded, county medical societies and other bodies of physicians have taken up the idea of sickness insurance. In California, the state medical society issued early in 1933 a pamphlet which not only endorsed the general principle of insurance in its applications to sickness, but proposed a plan whereby the county medical societies of the state were to offer medical care to the people of their localities in return for a stated annual payment. The actual development of the plans was left to the local societies, some of which, notably in Los Angeles, have effected an organization and offered such services. The subject has become of such wide interest in California that the state legislature, just before its adjournment in the autumn of 1933, created a commission to investigate health insurance and report to the legislature of 1935.

In the states of Washington and Oregon the medical societies have passed to a more advanced stage. Thus in Seattle, Tacoma, Yakima, Portland and in smaller places in both states, the county medical societies have organized "service bureaus" which are already furnishing services to substantial numbers of people in these cities under annual payment agreements, the insurance principle. Each subscriber pays so much per year, and his doctor's and hospital bills are paid for him, whether he has much or little sickness. In Seattle, the King County Medical Service Bureau offers the services of more than three hundred doctors to groups of employed persons. Although the plan was instituted during

the late summer of 1933, more than eight thousand subscribers had been enrolled by the end of the year. In Portland, one hundred and seventy doctors participate in the plan.

Experimental precedents had been set for these county medical society projects by a number of small groups of doctors, mostly in towns of the mid-West, a few in the East, which, having associated themselves with one another and with the facilities of clinics and hospitals, furnish service to patients in their locality for a regular payment per year.

These plans are experiments. They have the defects of newness and the possibility of commercialization. But they are the considered attempts of medical men to find solutions for economic and professional problems in their localities. The Medical Society of New Jersey expressed the constructive attitude underlying such experiments when they resolved, at their annual meeting last June, that "we physicians pass on at once from academic discussion to prompt and concerted action," and directed the organization of health service committees in each county society, for the purpose of "providing by existing health agencies adequate medical care for all people in each county at costs within their means." *

During 1933, the writer had occasion to meet with representatives of medical societies in four cities of the middle West and South, to discuss sickness insurance plans which committees had drawn up in tentative form. The State Medical Society of Michigan carried through at its own expense and published last autumn a careful study of the costs and needs of medical care in this state, and of the economic condition of its people and its physicians. After adopting a progressive report, the society authorized its committee to prepare practical plans for establishing demonstrations of sickness insurance in Michigan communities and has recently, in cooperation with the American College of Dentists, sent two representatives to England to secure a first-hand report of British sickness insurance. A committee of the American College of Surgeons, at its convention last October, proposed an extensive plan of medical service to industrial workers, and its program is being followed up by a representative committee of this influential professional body.

The Committee on the Costs of Medical Care rendered its

* Journal of the Medical Society of New Jersey, September, 1933, p. 28.

final report in December, 1932, but most of its studies were made during the years 1928–30, thus displaying conditions and problems which, as Mr. Roosevelt's words imply, were not created but have been merely emphasized by the economic changes of the last few years.

The Committee split when it came to shaping plans for practical application. The majority recommended a fuller planning and organization of medical practice, and an extensive use of the principle of insurance as a means for distributing the uneven and unpredictable costs of medical care so that they would not fall with crushing weight upon some of the people every year. The minority reports differed in degree rather than in principle. But the Journal of the American Medical Association, in an editorial appearing in December, 1932, just after the Committee had disbanded, attacked the majority report as a plan which would turn doctors into hirelings and treat sick people like robots, despite the fact that in addition to nearly all the economists, public health officials and other non-medical members of the Committee, sixteen physicians had signed this report, including a recent president of the American Medical Association, a member of President Hoover's cabinet. The editorial denounced the plan as "socialism and communism—inciting to revolution," contrasting "on the other side the organized medical profession of this country urging an orderly evolution guided by controlled experimentation."

The chief minority report, which the American Medical Association endorsed, had strongly recommended that county medical societies experiment with plans for medical care on an insurance basis. The editorial failed to comment on this constructive recommendation of the minority, and instead endorsed sickness insurance by commercial companies, although, curiously enough, both the minority and the majority reports had united in condemning this.

One would naturally assume that forward movements of county medical societies and other local bodies of physicians would have been led and coordinated by their national organization, particularly as this association had endorsed the minority report which recommended just such professional initiatives. But what are the observed actions, as contrasted with the logic of words? Plan after plan proposed by local groups of physicians or by county medical societies for establishing some organized

service or for utilizing the insurance principle to help people pay the costs of sickness has been checked or stifled, usually less by open attack from national headquarters than by fomenting opposition to it from certain elements in the local professional circle. In Milwaukee, a committee of the county medical society had during 1932 developed a scheme of sickness insurance to be offered to the people of their community even more comprehensive than the plans now in operation on the Pacific Coast. This plan began to attract more than local attention, but as soon as it became apparent that such a plan might be translated from paper into operation in Milwaukee, influence was exerted from the larger city eighty miles away, the plan suffered a series of adroit postponements, and it now lies in limbo in a committee, which apparently cannot dismiss it because of a real local interest and apparently will not report it out because of external pressure.

Nashville was one of the cities in which I had the privilege of discussing with the county medical society a similar plan which a committee had prepared. Six months later, one of the leading physicians of the city told me it had been decided not to try to push the plan further because of requests from one of the officials of the American Medical Association. Efforts of the same kind were made to dissuade the American Hospital Association from endorsing group hospitalization as a means of helping the average man pay his hospital bills. When this proved futile and when these hospital plans began to extend into more and more communities, a series of publications from the Bureau of Medical Economics of the American Medical Association appeared, describing hospital insurance plans, mostly those of a commercial or obviously faulty nature. Where these reports deal with sound and reputably organized schemes, they confine themselves chiefly to dangers and defects, presumably with the intent of discouraging any action. One scans these publications in vain for encouragement of that "controlled experimentation" to which the Association's editorial had referred as the method of evolutionary progress. By adroit phrasing, if not by direct statement—as when a recent editorial * refers to "all sorts of hospital insurance schemes" as "mechanizations of medical practice"—the road to experimentation is always fronted with a danger signal. It is never set with a green light.

* Journal of the American Medical Association, January 27, 1934, p. 295.

The extensive development of health insurance abroad has been made known but little to American physicians through their national journal and has been presented invariably in an unfavorable aspect. In 1912, when the law went into effect, it was strongly opposed by the British Medical Association. In 1921, when there had been nine years' experience with the law, the secretary of the Association wrote * that "not one doctor in a thousand who is doing national health work would willingly go back to the old system." In 1925, the Association endorsed the insurance system in an official memorandum to a Royal Commission. In 1933, the Association joined with other British agencies in formal felicitation of Mr. David Lloyd George, on the occasion of the twenty-first anniversary of the law which he had sponsored. The anonymous British correspondent who writes in the Journal of the American Medical Association gives currently the impression that the health insurance law of his country is regarded by responsible British physicians as fundamentally undesirable and defective. Officials of the British Medical Association have called attention to the errors and false color of this correspondent's reports.

In the November Bulletin of the American Medical Association there was published the larger part of an address made last summer † by Sir Henry Brackenbury, an English physician high in the councils of the British Medical Association. The portions reproduced contain criticisms of British Health Insurance made by Dr. Brackenbury and his proposals for improvement, but do not include the opening paragraphs of his speech in which he stated explicitly the fundamental general approval which he and the British Medical Association give to this law. The entire effect of his address is altered by this omission and by the italics and comments which the editors of this Bulletin insert.

Another professional body has adopted a very different attitude in this case regarding the limited but keenly felt issues of hospital service. Hospital care is necessarily expensive, and its heavy and unpredictable costs upset seriously even the middle-class budget, not to speak of the wage-earner's. Although only about one person in fifteen goes to a hospital annually, hospital-

* Journal of the American Medical Association, May 21, 1921, Vol. 76, No. 21, p. 1402.

† The address was delivered before the Royal Sanitary Institute, and was published in this Institute's Journal, August, 1933; also published in the Supplement to the British Medical Journal, July 15, 1933.

ized illnesses cost half of what the families of the United States spend for sickness. In February, 1933, the American Hospital Association approved the principle of insurance against the costs of hospital care, and recommended a plan called "Group Hospitalization," under which organized bodies of people, such as the employees of one or more industries, the members of clubs or other bodies, would pay each a small sum per year and in return have their hospital expenses paid when they needed hospital care.

A few hospitals in the middle West had experimented with such plans before 1933. In the spring of that year the Medical Society of the State of New York endorsed the principle of group hospitalization, the establishment of plans in that state having to wait the passage of an amendment to the insurance law which a responsible group of persons have drafted with the cooperation of the officials of the State Insurance Department. The Cleveland Academy of Medicine has given its official approval in resolutions recently published to the group hospitalization plan just launched by the Cleveland Hospital Council. By the end of 1933, partly as a result of the literature and advice distributed by the American Hospital Association, but still more because of widespread local need and demands, plans in twenty-five cities, affecting more than one hundred hospitals, were in effect, with the cooperation of the local profession, and they are under discussion or in process of organization in some fifty additional communities.

The general nature of these plans is exemplified in Newark, New Jersey, and the surrounding towns. Here a voluntary nonprofit organization, of which representatives of twenty-three hospitals and of the general public are the managers, offers hospital care up to three weeks in a year for the sum of nine dollars annually. Though not under way until 1933 was half gone, the Newark plan had enrolled five thousand members before the year closed. The annual charges under these plans range from less than five dollars, as in Akron, Ohio, to twelve dollars, depending on the extent of the benefits afforded and the general price levels of the community.

How far these voluntary hospital insurance plans will extend will depend on whether service can be offered at rates sufficiently low to meet the general public's demands, and whether the dangers of commercialization on the one side and of interference with professional interests on the other can be controlled. This form

of group budgeting for hospital care has made a fine start within the past year, but is still in its experimental stage. In England such voluntary hospital insurance plans were in their infancy ten years ago. Now they cover nearly half the population of London and two thirds of the population in a number of other English cities and towns. It is wise that the experimental period in this country should proceed with caution and with careful checking of methods and results, but it is important that it does proceed.

A far larger experiment was launched in 1933, namely, medical care for the unemployed. Millions of unemployed persons and their families had, up to the spring of last year, been furnished food and other material necessities out of local or state tax funds, with ever diminishing amounts from private charity. But they also needed medical care in sickness, for which they had to depend upon the charity of physicians and hospitals, and these were each month more overburdened by the mounting load. The Roosevelt administration, in courageously accepting a share of Federal responsibility for the relief of the unemployed, enunciated three far-reaching principles in respect to medical care. In the first place, medical care was officially declared to be a necessity along with fundamental material needs in the relief budget. Progressive charitable agencies have recognized this principle for many years, but most public relief agencies throughout the country have furnished medical care to indigent persons only in grave illness.

The second principle was that the physician should be compensated for his service to the unemployed and their families. Many physicians and social workers have long advocated this. It was explicitly recommended by the majority and minority reports of the Committee on the Costs of Medical Care, not as an emergency measure, but as justice both to the physician and to the public. The mass of people must in the long run pay higher medical fees if their physicians must give large amounts of time to unrequited service among the very poor.

The third principle was an administrative one. The Federal program recognizes the desirability of maintaining a relationship between the sick person and a family physician whenever possible, expects the state and local relief agencies to secure advice and systematic cooperation from the medical societies, and thus sets up a general method whereby physicians' services are to be secured, locally supervised, and paid for.

In addition to the assumption of public responsibility for medical care to the poor and for paying the doctor for his service, a most significant phase of this policy is the transfer of the actual responsibility for care from certain selected doctors in each community, appointed as city, county or clinic physicians, to the organized profession as a whole. As yet the system has been organized thus in only a limited number of states and is proceeding rather unevenly through the rest of the country. The plan has not been properly related, professionally or financially, with the work of hospitals and clinics; and in many cities and some whole states, the policy of using city and county physicians for the home care of the very poor seems to have been too satisfactory to displace. In some localities the medical societies have been unwilling to work the new policy because of fears about "state medicine"; in other places they have been ineffective in administrative cooperation. Although these medical services to the unemployed are temporary in their present scale, they are likely to have lasting significance by establishing policies and procedures of systematic relationships between organized bodies of physicians and public welfare agencies.

Under the national regulations, hospitals have not as yet been permitted to be paid out of Federal funds for the care of relief cases, but they have entered the system in many localities through state or local tax grants, and everywhere the necessities of the situation have caused the hospitals, ordinarily very individualistic institutions, to work together as never before on public issues as well as matters of mutual local interest. The organization of local councils, established to unify and coordinate hospital interests and activities, has thus been promoted in many sections.

The Federal relief program recognized also the need of nursing care and the obligation to pay for it. The national associations of nurses have taken leadership in shaping policies with the Federal authorities and in advising and guiding the state and local nursing bodies in the actual administration. Thus the new service has not only meant help for hundreds of thousands of sick people and much-needed work for thousands of unemployed nurses, but in many places it has also advanced a sounder organization of nursing service.

Another impulse to change has sprung from the great expansion of clinics during the depression. Countrywide returns

indicate that, since 1930, the clinics and the out-patient departments of hospitals have increased from fifty to one hundred per cent in numbers of patients, and this during a period when their funds and their staffs could rarely be enlarged. Clinics are active chiefly in the cities, and the majority of their patients require service from specialists rather than general practitioners.

Enlargement of clinic service has been proceeding for the last twenty-five years, and has been accompanied by frequent charges that many patients who are able to pay for medical care in the private offices of physicians are unfairly accepted by clinics. Studies in many different localities conducted by medical societies and other professional groups, by hospitals and clinics themselves, and by some public authorities have uniformly shown that upon actual investigation of patients' financial circumstances, only from two to five per cent could be regarded as able to pay private rates for the medical care they required. It is hardly reasonable to suppose that this percentage would increase during a period of widespread unemployment and depression. Nevertheless, the new peak in clinic patients has naturally been a source of anxiety to physicians and has aroused two diverse reactions.

One type is represented by a demand from some local medical societies that clinic service be restricted, that patients be admitted only when specifically recommended by physicians, or that, through various forms of pressure, the physicians on clinic staffs be brought to limit their services. The other type of reaction is represented by constructive and practicable measures which physicians have endeavored to work out in some cities, aiming both to relieve the overburdened clinics and also to enable patients who had previously had private physicians to retain this doctor-patient relationship. In Cleveland, for example, under a plan approved by the local medical society, four or five hundred physicians have placed themselves on a voluntary list as ready to care for such patients without any charge or for whatever nominal amount the patient can afford. The local clinics, hospitals, welfare agencies and medical profession are all involved in this attempt at a systematic scheme for community medical service.

Undone dental work has piled up as people have become short of funds, and it has been apparent that such individual charity as dentists could give was insufficient in amount and could not be depended on to reach the people who most needed it. The local

dental societies in New York, Chicago, and a few other places have worked out plans for referring patients to the offices of private dentists who are paid low stated fees out of relief funds for their services to patients who themselves cannot pay. In Chicago this is a large scale plan, involving some six hundred dentists to whom patients are sent from a central examining and supervisory office under the professional direction of a committee of the Chicago Dental Society.

All of the plans and experiments referred to in this paper involve not only the physicians and other agents furnishing medical care, but also the people receiving it. Projects for medical care must always involve both of these groups. Upon this principle rests the initiative which has been taken by consumers of medical service, such as industries, organized groups of employees, welfare agencies and philanthropic foundations. Some especial attention has been called to the activities of foundations in this field. Eight foundations cooperated in supporting the Committee on the Costs of Medical Care as a research body. Several of these foundations are interested in experimentation as well as investigation.

In the spring of 1933 the Milbank Memorial Fund announced that it would undertake a systematic and careful study of the best method of organizing sickness insurance in a typical American state. The Twentieth Century Fund declared its intention of establishing a department to assist in the organization of sickness insurance plans in which organized bodies of physicians were cooperating with groups of consumers. The Julius Rosenwald Fund has made studies and disseminated information concerning medical economics, furnished advice regarding practical projects, and cooperated with the American Hospital Association in promoting group hospitalization.

These foundations have been attacked by the editor of the Journal of the American Medical Association on the ground that they, as lay organizations, are "interfering" with medical practice, and that they are adopting policies concerning medical services without professional advice and guidance. I do not think these agencies require apology or defense, and I do not speak for them officially in these remarks. It seems, however, appropriate to remark that the millions of people, "lay" people, who receive medical care, upon their own bodies, and who pay for it, out of

their own pockets, have the right—and indeed the power—to say something about the conditions under which care shall be received and paid for. Likewise, a "lay" organization, established for public service, has the right, and indeed the obligation, to gather facts, express opinions, formulate policies, initiate and support experiments. When thus proceeding in matters affecting medical service, such organizations of course need professional advice and guidance, and from my knowledge of these agencies, they make a point of securing it. They find it necessary, however, to seek advice from physicians who have a constructive and not a negative attitude towards change in medical practice. There is a large and increasing number of such men, physicians who do their own thinking and who are in sympathy with the policy enunciated by President Roosevelt in one of his addresses last year: "The country needs and, unless I mistake its temper, the country demands bold, persistent experimentation. It is common sense to take a method and try it; if it fails, admit it frankly and try another. But above all, try something!"

As one sums up the developments of the last few years, one is led to contrast the reactionary expressions of some professional bodies with what thousands of physicians and hundreds of medical organizations throughout the country are now doing. Actions are more conclusive than words, and it is a most significant and encouraging fact that the organized actions of physicians during the past few years through medical societies, hospital staffs and clinic groups represent a larger measure of professional initiative and participation in sickness insurance and other organized projects than appeared in any European country during the period when these undertakings were in their formative stage. The movements abroad were almost exclusively initiated from industrial sources.

Americans do not want, and nobody ought to have, a cheap or impersonal doctor. Nobody questions that the physician is the authority about caring for the sick; but as to the system under which medical care is to be organized and paid for, the people who are the ultimate consumers and who meet the bills of the service must have more than a little to say. The American people are likely to be impatient of those who do nothing to aid experimentation, and have nothing themselves to propose except the philosophy of keeping things as they are. It would be appropriate

and expedient that national medical leaders should present constructive policies and practical proposals for dealing with the uneven costs of sickness, the unsystematic organization of medical service and the insufficient and unstable incomes of most physicians. The public has a right to demand, and I believe the intelligent American consumer does demand, at least these five elements in the care and protection of his health:

1. He wants medical service not as a charity, but paid for on a basis consistent with the self-respect of American citizens.

2. He wants a medical service which is so organized as to furnish him with continuous contact with a personally interested physician and which does not confuse and subdivide him among a number of independent competing specialists.

3. He wants a system of paying for medical service which will develop the maximum paying power from his income, and remove the hazard of unexpected sickness bills occurring at the time when his paying power is usually least.

4. He wants a system of payment which will stimulate the prevention rather than the care of sickness.

5. He wants good hospitals which are available to him geographically and financially.

These demands of the consumer of medical service are consistent with what the physician also desires and I believe the American public is sympathetic with and will support the demands of physicians and other professional workers for adequate and stable compensation, for the maintenance of high professional standards and for opportunity to keep abreast of advances in the science and art of medicine. In the pursuit of these aims, the public and the professions have a joint interest at stake. Neither can secure what it wants without the cooperation of the other.

HEALTH SERVICES OF TOMORROW

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It is not my purpose in this discussion either to attack or to defend current public health practice; nor have I any criticism whatever for the attitude of physicians concerning it. I feel that we have had enough of controversy; that in order to obtain a perspective of our several problems, we need to detach them, at least momentarily, from the exigencies of personal opinions and desires. It would seem to me that through a greater objectivity we may arrive at a clearer understanding of the past developments and present status of public health service. On the basis of that understanding, we should be able to analyze the trends of such service and to project the line of probable action. In the last analysis, each man must think this through for himself. He may find, as I have found in my effort to arrive at an objective interpretation, that his judgment of what is probable conflicts from time to time with his personal philosophy. Under such circumstances his acceptance of or opposition to the course of events must be predicated upon his intellectual honesty.

In the nation at large there is more than the usual need for open-mindedness; for respect for the point of view unlike our own, as well as a courageous tenacity in adhering to what is truly valuable in established methods. That widely divergent views are held by many—physicians and laymen alike—concerning various public aspects of medicine, no one can deny. Today's forum serves to crystalize these views and should give all of us a broader concept.

On both sides of the controversy we can assume for the most part a sincere desire for medical progress; for better and more complete health services to all the people. Where disagreement exists, it concerns the methods of procedures which will contribute to this progress so ardently desired by all of us. Incomplete information and misinformation fan the flame. Extremists, whether reactionary or radical, do not contribute to progress. The usual result of their labors is to impede it.

It is well to bear in mind that our individual or collective views as doctors have had little weight in the past. Unless we improve the technique of making our views felt, they will have little weight in the future determination of the structure, scope or content of public health. The people of each day and generation place an increasingly higher value on medical service. It would seem, however, that they consider themselves, as patients, as important a factor of medical service as ourselves. In consequence the medical profession conforms to the social system of which it is a part. Sigerist, expressing this point of view, recently said:

"There is one lesson that can be derived from history. It is this: that the physician's position in society is never determined by the physician himself, but by the society he is serving. We can oppose the development, we can retard it, but we will be unable to stop it."

From this there is apparent not only the futility of obstructing change but also of championing reforms which go beyond the current concepts of social responsibility. It is time that men should look to physicians themselves for guidance upon medical matters of public concern as well as those of private urgency. Nevertheless, the direction and distance we can lead toward a specific type of health service for tomorrow is limited sharply by the framework of tomorrow's social concepts.

Today's official health services reflect rather accurately our character as a nation.

Their diversity of form is in keeping with a similar diversity of political and social organization among the states, and even within a state.

Their incompleteness parallels the lack of concern for human rights and lack of confidence in government as an instrument for protecting human rights, which until recently characterized the popular mind.

Their individualistic idiosyncracies show, both in their weakness and their strength, precisely the lack of regimentation which is to be expected from a nation of individualists.

Their sectional differences represent a difference in problems. Industrialization has brought the need for compensation and safety laws, unavoidably incursions into the health field. The transition from an agrarian to an industrial civilization brings

a greater need for health service. Exotic diseases have given an impetus to public health work in the south. Many of the western states, free from the yellow fever and the hook-worm of the south, have been until recently too preoccupied with frontier problems to organize more than a perfunctory health service.

Tradition, too, has left its mark. The town meeting of early New England is reflected in the multiplicity of local health officers now found in these and adjacent states. Custom, also, helps to determine the quality and kind of service rendered. In many states and cities, a change of administration entails a clean sweep in health department officials and major employees. Services periodically are disrupted and no long range programs undertaken. In other states—New York is an example—it has become the custom to consider the health problem non-partisan. The State Health Department has passed through many successive administrations without political changes in personnel or policy. Where partisan politics control the health department, there is the same control of other community services.

The lack of professional leadership among those rendering health service probably is analogous to that in the medical profession as a whole; which, in turn, may be due to the low standards of professional education which prevailed until recent years among the rank and file.

If we add to these factors, the difficulties of scientific appraisal inherent in many aspects of health service, as in many phases of medical practice, the gap between the present and the ideal in this country is easily understood.

Public health, too, is founded upon scientific discoveries which are comparatively recent. There is an inevitable cultural lag between the acquisition of knowledge and its application to the community. Although the desire, moreover, for life and health is a basic human emotion, the absence of disease, the prevention of an epidemic, the saving of life generally is rated as a negative accomplishment. It is not dramatized in the public consciousness.

Statesmen from Disraeli to Roosevelt have expressed the thought that the care of the public health is a primary responsibility of government. Blackstone interpreted the legalistic aspect when he said, "The right to the enjoyment of health is a subdivision of the right of personal liberty, one of the *absolute* rights of persons."

These concepts mean that the community collectively should perform for its citizens: (1) those services which are so important to the social organism that they can not safely be left to the initiative of the individual uneducated or indifferent as to their importance; (2) those services which of their nature the individual can not provide for himself. So far, however, the performance of such services is more theory than fact. Public health has not been a major issue of our government in the past. In this present, when all human issues are coming to the fore, economic pressure—the necessity of providing a world fit to live in—has continued to shunt aside from public consciousness the present needless sacrifice of human life and efficiency by our inadequate use of scientific medicine. Current measures to restore minimum standards of living, however, are doing more to preserve the mental and physical health of the nation than a frontal attack on disease alone.

Unfortunately, we have inaction and retrogression even in functions, such as control of communicable disease, which are generally accepted as appropriate spheres for governmental action; and in the line of private health protection, citizens have become increasingly unable to provide necessary medical service for themselves.

The distribution of present health and medical expenditures is distinctly inequitable, only 3 per cent of the total being made for preventive services, public and private. Out of a total per capita expenditure each year of $30 for all medical care, only $1 is spent for prevention. Quacks, nostrums and patent medicines collect too large a part of the remainder.

Public health has not attracted the best of medical graduates. It has not in the past offered a satisfactory career because the financial rewards were modest and the openings, not influenced by partisan politics, were few. Before we can realize a completely sound health plan for tomorrow we must raise up a new generation, not only of leaders, but of well-trained men in the ranks.

Funds for the work have been scanty. Three fourths of our rural population have not even the elements of a public health service. Between 1931 and 1932, health budgets in cities and states, already inadequate for the proper conduct of minimum activities, declined on the average of 17 per cent. In Alabama

the cut was 50 per cent; in Mississippi and North Dakota, 75 per cent.

It is true that remarkable accomplishments have been made in the prevention of disease during the past two decades. The life span has been increased by nine years in that period. Deaths among infants have been cut in half; deaths from tuberculosis have gone down 60 per cent. Typhoid fever and diphtheria now are rare diseases in many communities. But it is likewise true that these accomplishments are less than half of what is easily possible if all communities were to provide for their citizens the health protective facilities now provided by a few communities.

A further increase in the life span by another ten years is entirely possible. Of even greater economic importance is the disease and disability which can be prevented. Typhoid fever and diphtheria can be eradicated. The infant mortality rate can again be cut in half. Almost two thirds of the present 13,000 deaths of women in childbirth in this country each year can be prevented;—the continued high prevalence of puerperal mortality is a joint indictment against our present systems of medical service and of public health. Present public action against the venereal diseases is sporadic and unintelligent, while private physicians, as a group, are making no progress in reducing prevalence. Of the 720,000 cases of syphilis clinically recognized each year, more than one half do not seek treatment within the first year of the disease; and only 3 per cent begin treatment in the seronegative primary stage when the hope of cure is greatest. Little effort is made to seek out sources of infection by epidemiological methods proven highly effective. As a result the venereal diseases are increasing and constitute a leading cause of sickness and death, as well as a large addition to the load of the unfit for whom society must care.

Tuberculosis is another campaign in which the battle is only half won, and in which it is possible to reduce by half the present 75,000 annual deaths.

Deaths from cancer continue to increase, in spite of the curability of possibly one third of these cases.

The medical profession, as at present constituted, increasingly is unable to provide for all the people the minimum essentials of medical care, without adding unbearably to the load of poorly paid and unpaid work they now carry. Three factors have con-

tributed to this situation: First, although many human ailments can be treated satisfactorily with limited equipment, scientific advances have increased constantly the complexity and the cost of medical service. Second, the lowered income of a large part of the population has put medical care beyond the reach of an increasing number. As a result, many physicians—dentists and nurses as well—find themselves today almost destitute. Third, people who are not ill and not confronted by a threat of illness are unwilling or uneducated to pay out of pocket for a preventive service.

Few will deny that our health system falls woefully short of results. Yet there are those who would limit public health service to environmental sanitation, the quarantine of acute communicable diseases, the care of the insane and of other indigent sick. To accept this view is to ignore not only the inherent responsibility of government but the scientific factors and our considerable experience in public medical care. The quality of such service compares favorably with private treatment for the same class of patients in tuberculosis sanatoria, mental disease hospitals, venereal disease clinics, public general hospitals, and immunization clinics.

It is no longer easy to secure applause by damning the government because of its interference, without valid evidence that alone and unaided by government we can do a better job.

We may consider the potential scope of public health service as the application of biologic knowledge for the prevention and cure of disease and the promotion of health. In forecasting the health services of tomorrow, we need to determine what functions government, better than other agencies, can exercise to serve the health needs of the people. Society as a whole is indifferent to the squabble between public health officialdom and the medical hierarchy concerning the prerogatives of each. What happens to our present public health system or to the private practice of medicine, as we know them both today, will not be determined by the resolutions of medical societies nor yet by the recommendations of health officers.

It seems generally agreed that the current social and economic revolution can not stop where it is. Are we to go forward during the coming years, veer left or right? We will not go back. We must assume that in any event we have faith in our capacity to

adjust governmental forms to serve the people better than in the immediate past.

First, it is possible that the speedy return of economic prosperity may be accompanied by a revolt of trade and industry against onerous governmental control. As a result we may emerge with much of the forms and the formlessness of yesterday; the chief social residue of the recent tragic era being a somewhat better conception of individual rights and some means of preventing the more flagrant abuses and exploitations of those rights.

There is a second contingency: that we may continue our present trend toward a regulated capitalism with trade associations and cartels operating the economic system of the country under government regulation and control. In such a system, cooperative effort will be the dominant factor.

It must also be considered that we may show an incapacity for cooperative capitalistic effort. We may revolt against rigid regulation which fails to bring high profits in its wake. Recently, in an informal discussion of the subject, I heard a capitalist of major rank intimate that business as a whole may prove itself too dishonest to function under the regulations of an industrially controlled system. What then? Perhaps chaos as an interlude, but ultimately and possibly soon, a socialistic state.

Whatever the path we take, regardless of how earnestly as doctors we may fight for it or against it, the health service of tomorrow inevitably will conform to whatever is the governmental framework.

If the political philosophy of yesterday again prevails, we shall, of course, continue the traditional forms of medicine and public health. The state will perform more completely, and better, I hope, the services which it now undertakes. New tasks will be added as the developing body of scientific knowledge and the needs of the people determine.

An essential part of this system, in my opinion, are the tools for better work which can be placed in the hands of the practicing physician. Among the aids which the most individualistic of doctors, in large numbers, have approved and used are: county general hospitals, managed by local medical boards and open to all citizens at a cost within their means; diagnostic laboratories, for diagnosis of clinical as well as communicable disease; free biologic products and arsphenamines; community nursing, plus case finding; and consultation service.

Such accessories to care as x-ray, laboratory, nursing and hospital costs, often outweigh the actual medical charges. If these accessories are furnished by the community, the medical bill frequently can be paid, the personal relationship of physician and patient retained, and the quality of medical service promoted.

For it must be remembered that a patient may be able and willing to pay for an office call or for attendance at childbirth, yet be unable to negotiate for a cancer operation or the rehabilitation of a crippled child. For this reason it may prove very serviceable to the general practitioner for tax levies to supplement inadequate private subscriptions for the support of hospital and dispensary service; and for facilities now provided for the care of the insane, the aged, the tuberculous and the venereally infected to be extended to other chronic and therefore expensive diseases.

But even under an economic system restored to familiar patterns there is an uncertain medical factor. During past months, there have been some five million families—about 18 per cent of the population—receiving from public funds all the necessities of life including medical care. Under the happiest of conditions their restoration to self support will be gradual. Having accepted free and, in about a third of the states, moderately adequate medical care—in many instances more freely available than in their whole previous experience, and of better quality than provided by the quacks and shysters so often patronized by those in the lower income classes—will they, having experienced such care, continue to insist upon it? The history of benefits to veterans gives us food for serious thought on this subject.

Under the traditional system the problem will grow more acute as to how both preventive and treatment needs will be met for the lower income classes. Medical societies will continue to advocate payment of fees from taxes to physicians for these purposes. The bogey of "state medicine" has been removed by acceptance of this principle. All of us now agree that public (viz., tax-supported) action is necessary. Witness the enthusiasm with which the Detroit plan has received medical approbation.

There remain only three relatively minor issues: First, should a particular service be rendered in the home and the doctor's office by any qualified physician on a fee basis paid by the public; or should it be rendered by part-time or full-time physicians? This

issue will be resolved very simply. The taxpayer will choose the method which gives a satisfactory service at the lowest cost. This will vary but, in general, experience has shown that preventive services now rendered by health departments can be done reasonably well and least expensively by organized clinics. In rural areas on the other hand the fee for service basis may prove best for certain disease conditions. We have not arrived at our present situation fortuitously.

It is agreed that individual attention, whether preventive or curative, by a skilled and interested physician is the best type of medical care. We should each of us prefer it, just as we should prefer a special nurse and a private hospital room, if we could afford it, when we ourselves were ill. Yet if we can not pay for anything better there is nothing inherently vicious about the general nursing service, the ward room, or preventive care and treatment in the clinic when otherwise the community and the individual would suffer from no service at all. In fact, provable progress against disease prevalence has been made thereby. Further, we can find skillful and interested physicians in the public service, who treat patients as well as problems; we can find unskillful, uninterested physicians in private service, to whom the patient is but a means for filling the pocketbook. The quality of any service depends upon the integrity and ability of its personnel. Neither public nor private medical service is all good or all bad.

The second issue in public medical care is at what income level shall we draw the line of eligibility? In measures to control a communicable disease the primary purpose is to protect the community. Hence, ability to pay for the treatment of smallpox or bubonic plague is purely a secondary consideration. Also, "ability to pay" for general medical care varies with the nature of the condition and therefore the cost of treatment.

A third issue is whether needed public medical service should be administered by a department of social welfare or by a department of health. I hold very strongly to the view that all public medical and health work should be done by the health department. Here we have the medical foundation which is lacking among social workers. Counterbalancing this, however, the social workers make out a good case for unifying medical relief with other relief and social reconstruction measures. This argu-

ment, plus the continued barrage of some medical groups to make prevention and not cure the objective of health service, may reduce health departments to the status of sanitary police, while the major health-promoting functions of the community are carried on by non-medical welfare agencies.

It is an interesting anomaly that if we move ahead and to the right, politically, the current of traditional medicine seems to carry the private practitioner farther and farther away from responsibility for preventive medicine in general; and for treatment of disease which if neglected would be harmful to the community either because of its infectious nature or because the untreated individual or his family might become a public charge. The reason is simple. The doctor, of his own volition, has rendered long and valiant service for the poor and needy. Yet bound down as he is by the competitive system, we can not expect him to assume the load of preventive services—nor do we find him volunteering to do it—when he finds it difficult to obtain reasonable compensation for what he does. Neither can the doctor's benevolence absorb the vast strata of those victims of technological maladministration whose sole asset is an uncertain wage at or below the bleakest living requirement. If tax funds are available for the treatment of these cases, it is probable that the taxpayers' insistence on economy will result in the expenditure of these funds largely through the organized clinic rather than in the doctor's office, and for salaried physicians rather than fees-for-service.

If on the other hand the current economic revolution leads ahead and left to a regulated capitalism, with industrial cooperation under government control, then we almost certainly shall see various schemes of social insurance,—old age, unemployment and sickness. The contest in this case will be over the nature and extent of supervision of the service, the extent of tax support, the freedom of choice and compensation of the physician, the restrictions on specialization, the voluntary or compulsory nature of the system, and the inclusion of cash as well as medical benefits. Where most successful, sickness insurance requires the general practitioner as the keystone in providing a preventive and general medical service to the family as a unit, with reasonable and assured compensation. The work of health departments

would be proportionately minimized in the treatment field as these services, paid for in advance, are available from the family physician.

In fact, is it not possible that the medical profession itself will be the prime advocate of sickness insurance as the least objectionable way of preserving the general practitioner and of attaining economic security. Here, then, is the paradox: As we move ahead along traditional lines, private medical practice is forced away from its preventive and many of its treatment functions. As we move to the left by abandoning traditional forms, private medical practice regains its traditional inclusive responsibility for both prevention and treatment.

The program of the British Medical Association entitled "A Medical Service for the Nation" deserves consideration if we anticipate this state of society.

If, through evolution or revolution we find ourselves to the extreme left and part of a socialist state tomorrow, then we doctors, too, will be socialists. Or, if we are not, our successors will be. State medicine will exist in the sense that the state will operate medical and health services in a manner comparable to our present system of public education. The medical recommendations contained in the platform of the British Labor Party give at least a rough idea of what this would be like. Or, if we recognize obvious differences in the level of medicine here and in Russia at the beginning of the World War, we may find some suggestions in the medical organization of that country.

What then is a doctor to do in a changing world? Is he to fight all suggested innovations as encroachments upon his livelihood? Will he have a voice in his own salvation, or is he dust upon the wheel of circumstances?

You will notice I said "doctor"—not "private doctor" or "public health" doctor. Good or bad, we are cut from the same cloth. We face transition of status and opportunity that will be far-reaching for each of us; but, as I said in the beginning, every man must think out for himself what lies ahead and what his personal attitude toward it will be. To my mind, these are the attitudes of an honest, earnest, well-trained doctor of today:

He is unafraid. The doctor's job, whether his present concern is private practice or public health, is paramount to the nation's

welfare. Whatever the political framework of tomorrow, there will be a place for him and a place in the sun.

He continues to learn. He feels a maladjustment in the society he serves, and he seeks to understand it in the whole as well as in part. He considers with an open mind at least two sides of a suggestion: his own and the patient's. He is eager for new information; he faces facts.

He participates. If he is a practicing physician, he is active in obtaining and maintaining a first class health department for his community. If it is partisan-ridden, he helps to turn the rascals out and to change the rules so that a good job is possible. If he is a health officer, he keeps close to clinical medicine and medical research. He takes counsel with private physicians; he is familiar with their problems.

He plays fair. He is not petty himself nor will he tolerate the factional bitterness which has made so many a medical organization the synonym for strife.

And last, he looks ahead, in terms of the community and the nation, as well as himself and his profession. He is a good citizen.

You may think I have discussed a tomorrow too far away. Time alone can give a valid answer.

What I have attempted to do is to consider alternate political systems of which we will be a part, and to suggest different types of medical and health services within the framework which society places around us.

I have said that as doctors—as guild members—we have not in the past influenced the social structure in which we find ourselves; nor are our resolutions or recommendations likely to mould it tomorrow. When we speak as doctors alone, we have been suspected of self-interest. Yet as citizens we have full voice in the new order of things, and as doctors it is possible for us to implant in every citizen a respect for scientific medicine, for its potentialities and for its practitioners, which will make easy the adjustments of tomorrow.

What we need is more evangelism in medicine—more concern for the citizen unserved, or poorly served. What we have had is a virulent sectarianism—a concern lest he be served by others who receive the reward.

Let us, then, study the needs of the people for health, con-

sider the service which science has made possible, and interpret to the people the best ways of applying science to health promotion. In doing this let us keep in mind two principles:

1. Progress made through evolution rests on a sounder basis than when the change is revolutionary.

2. The *form* of a program is not so important as the *spirit*. Drawn today, it may need to be modified tomorrow, but the ideals of that program, the spirit which conceives it, must be as unchanging as the tides.

THE DOCTOR AND THE STATE

By MORRIS FISHBEIN, M.D.

(*Editor, Journal of the American Medical Association*)

Since November, 1932, when the Committee on the Costs of Medical Care promulgated its majority and minority reports to the medical profession and to the public of this country, the relationship which the state should bear to the medical profession has been a much debated topic in this country. Many of those who participate in the program here today have on previous occasions recorded their views. Not only have articles been published in periodicals for the public, for the medical profession and for economists, sociologists and lawyers; programs devoted to medical economics have been offered to medical societies, congresses on education and innumerable lay organizations. In the program presented here today there has been much public exposure and airing of medical linen, but largely by laundrymen who, for the most part, do not appear to be members of the family. Thus the audience has been intrigued, if not embarrassed, by the spectacle of father's red flannels and daughter's scanties displayed in a manner which might not have been so scandalous had the family wash been subjected to the sympathetic attention of mother or some other member of the family. Indeed, the attitude of many of those who have addressed you concerning the medical profession today might well be defined by the celebrated epigram from the oration over Julius Caesar by Mark Antony, in which he said: "I come to bury Caesar, not to praise him."

The points of view of those who speak are fundamental in the appraisal of any consideration of this subject. The medical profession has insisted with remarkable unanimity that no other group except physicians is really entitled to say how medicine shall be practiced, for only the physicians are competent by training and experience to judge adequately the quality of medical care. There is no criterion of adequate medical care except the quality of the care that is rendered.

For some months now audience after audience, viewing a play

on Broadway called "Men in White," has burst spontaneously into applause after a bit of dialogue in the first act. The resident physician of a hospital, Ferguson, is talking to Levine, a doctor who practices on the east side of New York. Ferguson has been describing the difficulties under which his father, a country physician upstate, had endeavored to practice medicine. The motto of this country doctor had been: "Above all is humanity!" The old man died poor and in the harness. Levine says: "A doctor shouldn't have to worry about money. That's one disease he's not trained to fight. It either corrupts him—or it destroys him." And then he reflects: "Well, maybe some day the State will take over Medicine." To this Ferguson replies: "Before we let the State control Medicine we'd have to put every politician on the operating table and cut out his acquisitive instincts." And here each audience bursts into applause. This applause need not necessarily be taken as the attitude of the public toward state medicine, but it may represent the attitude of the public toward politicians.

The relationship of the state to the practice of medicine is no new subject to the medical profession either in this country or abroad. The time has long since passed when the family doctor in his relationships to his patients represented complete medical responsibility and care. When great plagues swept across Europe in the Middle Ages, devastating the populations, the state organized the attack against those plagues. In fact, when Moses led the Children of Israel out of the land of Egypt he laid down certain health laws, as a representative of the state, which have been recognized ever since that time as reasonable responsibilities of the state in regard to medical care. He was concerned with rest, with food and water and with communicable disease. From the first, the medical profession has recognized the right of the state to an interest in medicine as it concerns the community in the mass. However, the medical profession has, during the past quarter-century, been confronted with many facts indicating the desire of the state to enter more fully into the problems of medical care. It has seen the extension of free clinics. It has participated in a multitude of surveys and demonstrations. It has witnessed innumerable attempts by the state to contract for medical care under a variety of conditions. It has observed the establishment in most of the large universities in this country of health services

which undertake to provide complete medical care for the students of these universities.

The medical profession has noted also the attempts of health officers in some communities to broaden unduly the scope of their work. Indeed, Dr. Thomas Parran, at a recent meeting of the American Medical Association, himself listed the many ways in which, in the State of New York, the government has undertaken participation in medical practice. All these things medicine has witnessed, and in many of them it has given largely of its services, making for their success.

Without the cooperation of the medical profession no system of medical practice can succeed. One listens with amusement, if not with amazement, therefore, to the threats of many of the leaders of the organizations that have been encouraging widespread propaganda for nationalization of property and socialization of personal service, when they say to the medical profession that unless it socializes itself socialization will be forced upon it. No well-organized body can be forced into any position. The medical profession, as an intimate part of our nation, will no doubt participate, indeed already has, in the general trend of our government. There has been in our government a trend toward socialization for some twenty years. It is interesting to realize, as was pointed out by the President of the Indiana State Medical Association in a recent address, that all but two of the planks in the Socialistic Platform of 1912 have today become part of the law of our land. Nevertheless, those who know and understand the nature of medical care, including particularly the diagnosis and treatment of disease in the individual, are inclined to believe that the last stand of the citizen in maintaining his status as an individual human being is going to be in times of disease. A man at work in a gang along the side of the road, a soldier who is a fragment of humanity in a regiment of cannon fodder, a robot in one of our great industrial plants who spends minute after minute, day after day, performing the same mechanical functions, has but little opportunity to feel that he is an individual human being. But when a splinter of steel flies into his eye, when his shoulder begins to ache with the stress of the pick and shovel, or when he inadvertently takes into his system a large dose of Endameba histolytica with drinking water which he has been assured by the state is quite free from contamination, he begins to realize that

there are parts of his body that have no realization of the state's desire to care for him. These parts make their presence known in a most disagreeable manner. At such times he seems to prefer a physician who will look at his eye not as an eye belonging to the state but as an eye belonging to John Smith. He prefers a physician who will treat his amebic dysentery without any relationship to the state's responsibility for having permitted the conditions that caused that dysentery to develop. He finds himself in his relationship to the state exactly as he finds himself in his relationship to an employer who wants from his labor all the work that he can get but who wants to pay to his labor the least that can be paid. Those who have watched the tender care of the state for the public in times of stress realize that the sympathy, the understanding, and the humanity of state employees toward the unfortunate is not always manifested with what might be called humanism. Those who have read in "Little Man, What Now" the experience of the German laborer who was trying to get from his government something in the way of benefits under the insurance act in Germany will find a startling example of the way in which bureaucratic employees under most circumstances concern themselves with the problem of the individual sick man.

There is hardly one of the socialized medical services and the state medical services that have been developed in various parts of the world that has not constantly been subjected to criticism of political manipulation. The answer of those who would socialize medicine to the charge that under a system conducted by physicians politics would not enter into the picture is in itself too naive to merit consideration. In Brooklyn there seems to be in process of formation a medical league for socialized medicine, which attempts in one of its prospectuses an answer to this fundamental question:

"Under socialized medicine you would not substitute an evil (politics) for something that does not exist in the present system. Politics cannot be worse under socialized medicine than exists today. It is a fact that no doctor can advance much without hospital affiliation. It is no secret that he has to play politics (social, financial, and political) in order to be connected, to advance or to hang onto his position. This is also true of other medical institutions, insurance companies, and all forms of present-day contract practice. It is true even of much of our private practice."

As long as men are human beings they will continue to react personally on each other. As long as nations are subject to political manipulation, contracts between a nation and the individual in the nation are merely matters of form. Consider what happened in Germany to its social insurance scheme when the Hitler regime took over the reins. What then of the contracts held by physicians with various sickness organizations? What then of the high standard of medical practice set up in Germany under a different reign? What of the resolution which was promulgated by the new government, licensing 5,000 naturopathists and telling the medical profession to turn its face to the naturopathic system of practice? Such are the possibilities in medical care when a non-medical government is in the saddle.

What of Russia with its Sovietized system of red medicine, so sympathetically and joyously considered in the recent writings of Messrs Newsholme and Kingsbury? Their 9,000 mile jaunt in four weeks obviously gave them opportunity to see all the best that red medicine had to offer; but the review of their observations in the *New York Times* brings to light the remarkable vagaries of their health inspection tour and leads an enlightened reviewer to conclude that it resembles nothing like a scientific investigation of the facts. What about the examination of that communist student of physiology who was flunked by his professor when he gave the composition of air as 10 per cent oxygen, 5 per cent hydrogen, 65 per cent nitrogen, and 10 per cent temperature? The professor was then ordered by the government to re-examine the youth on the same subject two weeks later after he had had time to look up the answers and inform himself as to his error. What about the patients of this young man some years later when he has been appointed by his government to take care of a considerable number of them? Will they have opportunity to cry out from their tombs against governmental appointment of incompetent doctors? Alas, we know only too well that there is no raising from the dead!

If there is any one fact apparent in relationship to all of the systems of state and socialized medicine that have been developed throughout the world, it is that not one of them has been established as a success. There is not one of even the most prejudiced investigators of such systems who is willing to say that the United States today should establish a similar system for the people of

this country. But with the folly that has inevitably characterized the projectors of fantastic schemes for social reorganization, perhaps with an inordinate pride in American democracy, those who urge the socialization of medicine insist that where others have failed with such systems Americans will be sure to succeed. Have they any evidence that there is any reason to anticipate such success?

In 1917, the following resolution was offered to the House of Delegates of the American Medical Association and adopted by them. It was just after the British system had begun to function and at a time when the insurance system seemed to answer for the public the problem of medical care. The resolution read:

"Resolved that the House of Delegates of the American Medical Association in the interests of both the wage-earners and the medical profession authorize its Council on Health and Public Instruction to continue to study and to make reports on the future development of social insurance legislation and to cooperate, when possible, in the molding of these laws that the health of the community may be properly safeguarded, and the interests of the medical profession protected, and be it further Resolved, that the House of Delegates instruct its Council on Health and Public Instruction to insist that such legislation shall provide for freedom of choice of physician by the insured; payment of the physician in proporton to the amount of work done; the separation of the functions of medical supervision from the function of the daily care of the sick; and adequate representation of the medical profession on the appropriate administrative bodies."

In the sixteen years that have intervened the medical profession seems to have become more definitely opposed to nation-wide social insurance and state medicine than it was then. In 1927 the funds were collected for establishing the Committee on the Costs of Medical Care, and in 1932 the majority of that committee brought in its report favoring essentially a system of socialized medicine. Nevertheless, by 1932 the nation was in the midst of an economic depression from which there is doubt as yet that it has wholly emerged. Perhaps the economists will function satisfactorily as physicians to the nation in its time of depression, but it is doubted that they have the knowledge to cure the social evils which are basic in the nature of man. It is doubted that they know enough about the mind and body of a man diseased to organize a system for his cure. Indeed, even the methods of cure for the

economic difficulties of the nation are in that stage of science in which medicine was at the time of Hippocrates. They offer remedies for the nation's economic troubles as the physician of today endeavors to treat arthritis—knowing of no specific cause of arthritis, he recommends salicylates and cinchophen; he uses hydrotherapy, diathermy and rest in bed, and massage, and then is still ready to send the patient to a hot climate and to recommend consultation with three more specialists.

However, the treatment of the economic illnesses of a nation is not to be compared wholly with the diagnosis and treatment of the disease of an individual human being. That is an intensely personal matter. Indeed, the best evidence of the exceedingly personal character of such attention may be found in the demonstration of national and personal prejudice in relationship to medical care manifested in the classified advertisements published in the columns of The Journal of the American Medical Association. Bear in mind that the population of the United States is not homogeneous. The statement that Great Britain, France, Germany and similar countries have had even partial success with systems of national medical care is no guarantee that these systems would work even partially in the United States. In the classified advertisements referred to, one physician asks for an assistant in his practice who must be a third degree Mason; another requires a Shriner; a third says only a Catholic will serve; and a fourth feels that the assistant must be a woman. These men who are advertising for assistants to aid them in the care of the sick in their particular province in the community know that personal relationships will enter into medical care which are as fundamental in securing a result in many cases as is a diphtheria anti-toxin in a case of diphtheria. They know that human beings are composed of both a mind and a body and that any attempt in the present state of medical knowledge to treat the body alone and not to treat the human being as a whole will lower the standards of quality of medical care. Again I would emphasize that only by the quality of medical care is it possible to judge medical service.

I have spoken thus far largely in generalities, because it seemed to me that the prime purpose of this meeting was to lay before the public an understanding of the situation which exists today. I have said that the question of the attitudes of the speak-

ers is fundamental to a consideration of the subject. Any one who has studied the bibliographies of the members of the Committee on the Costs of Medical Care could have told long before its report was issued what the nature of the reports would be. Since the announcement of the meetings held here today physicians have written in considerable numbers pointing out that the program seemed to be stacked against the medical profession, for the medical profession as a whole is quite familiar with the points of view not only of its own representatives on this program but also of Drs. Sydenstricker, Michael Davis, and Parran, and with the views of Mr. William T. Foster who follows me.

It is not surprising to hear Dr. Sydenstricker assert that the profession is bound by taboos and traditions which must be overthrown; neither is it remarkable to hear him insinuate that our entire economic, social and political system needs reorganizing. It is annoying however to have him center his attention on medicine and want to begin all the reorganization with the medical profession. Yet as an employe of the Milbank Foundation what other course is open to him? That foundation is pledged to a program for socialization of medical care and its executive secretary Mr. Kingsbury has become enamored of what was shown to him in a personally conducted tour of Russia.

No better proof of the necessity for medical advice in a study of medical matters could be offered than Professor Bossard's analysis of the distribution of physicians and hospitals in Philadelphia, of his attempt to trace an analogy between university health services and military medical services offered to special classes of the population under peculiar conditions with the medical care that must be given to people generally, living in their own homes and subject to all of the vicissitudes of existence, such as lack of fuel, bad housing, improper nutrition and want of many of the other necessities of a bare existence. He points out that the poor suffer much more with illness than do the rich, but he does not attempt to cure them of the cause of their illnesses which lies largely in their poverty. Quite unscientifically and wholly unmedically he would not attack the cause of their illnesses, but worries about diagnosis and treatment after the illnesses develop. His maps of the distribution of physicians in Philadelphia prove just one thing—that a patient will travel many miles and pass by the offices of innumerable competent doctors from a legal and

scientific and educational point of view to get the doctor that he wants to take care of him. And Professor Bossard ends his discussion with the same old threat: if the doctors do not give us what we want there may be violence. Well, the doctors in Germany and France and in England have been giving the people what the politicians and the economists said the people wanted and there is violence. And a hundred competent observers including many in high places do not find the vast majority of the people of the United States dissatisfied with the type of medical care available to most of them today.

It is asserted by both Messrs. Sydenstricker and Davis that the organized medical profession does not today represent the majority of physicians. If it does not then the Congress and Senate and the President of the United States do not represent the people because the American Medical Association has been since 1901 organized and conducted on a strictly democratic representative basis. He accuses the secretary of the Association and myself as editor of having failed to represent conditions here and abroad adequately to the profession and then he fills his manuscript with quotations from the Journal of the American Medical Association to prove the value of the foreign systems of practice that he supports. Mr. Davis indicts the medical profession because of its opposition to certain plans of hospital insurance. He fails to point out that in the period of prosperity when money was spent in madness hospitals over expanded, attempted to ape the wealthiest hotels in their constructions, provided for nurses in their competition to get free nursing service with dance halls, swimming pools, libraries and great reception halls, and then, when caught by the depression, in many instances tried to save themselves from bankruptcy through the development of schemes which would disrupt, disorganize and exploit the medical profession. He forgets that the quality of service rendered by any hospital can be measured only by the quality of physicians who compose its staff. And finally he fails to state how many of the experimental schemes to which he points with pride were initiated by personal visitations from members of the Milbank and Rosenwald Funds, subsidized with money coming from these funds and promoted with propaganda paid for by these funds. Insofar as any of the experiments has succeeded, and no one can say now whether or not

any of them will succeed, they have been made possible by the tolerance and cooperation of the organized medical profession.

The American Medical Association has never opposed honest scientific experimentation. But it has asked that the game be played according to the rules laid down by a thousand years of tradition and experiment. The rules were made to safeguard the interests of the sick individual, not, like the rules of so many of our philanthropies, to make a vast number of people, dissatisfied with their hours of work and the wages they receive, complacent because somebody else pays for the costs of their illnesses. The sociologist E. A. Ross, talking of philanthropy with strings, points out that medical care on a philanthropic basis has come to be the philanthropists' panacea for social unrest.

It is useless to attempt to distinguish between the content of medical practice and the method of administration. The whole question of mutual responsibility between patient and physician is basic. Shall the doctor be responsible to the patient whom he serves, protecting the interests of the patient and considering those interests first or shall he be responsible to the industry which employs the patient, the insurance company which insures him, the government which dictates to him, or the hospital to which he consigns his body in times of sickness Shall the doctor or the insurance adjuster say how long the patient is to lie in bed after an operation for appendicitis? Shall the doctor or the employer say when the sick man is able to come back to work? I must insist that these are questions which only a physician with the patient as his first interest is able to answer satisfactorily for that patient.

The medical profession has witnessed some interesting spectacles of late. It has seen a Hugh Cabot who argued for social insurance and state medicine come back from abroad and announce that the standard of medical care in the United States today is better than he found it in five foreign countries. It has seen England disturbed for fear that its system of compulsory health insurance would bankrupt the nation as it has already bankrupted the voluntary hospitals, and it has seen politicians offering as a cure for the situation more social insurance. Similia similibus curantur.

The majority of American physicians have not been greatly concerned about the entrance of the state into medical practice; and Walter Lippmann says that the people generally are even less

concerned. In most communities there have been departments of public health which are able to accomplish results in preventive medicine by cooperation with the medical profession. Some of these departments have entered much more fully into medical practice than others. Eventually the Vaughan plan was developed in Detroit, under which physicians immunized individual patients against infectious disease and were paid for the service by the state when payment could not be made by the patient himself. At the same time, of course, the state supplied the materials for such immunization. Gradually health departments in some places encroached on the province of the medical profession. When money was freely available some even attempted to conduct periodic physical examinations. Then came the depression, and with the depression a tremendous lowering of budgets of health departments. When these budgets were lowered, health departments discontinued most of their services to the individual and concerned themselves more and more with those functions involving the prevention of disease by the control of the water supply and of the food supply, the disposal of sewage and the control of epidemics. These may be considered well established functions of health departments. Moreover, the health departments continue to devote themselves largely to education of the public in the nature of disease and in the desirability of early consultation with the family physician.

Beyond these phases of government participation in medical care there was also the Veterans Bureau. When the depression arrived the government was able to see the folly of giving complete medical and surgical care to men who had been veterans and who were well able to pay for such care when the illness or disability bore no relationship whatever to the government service.

Under the Federal Emergency Relief Administration arrangements are being made by county medical societies with county administrators of relief for the care of the indigent sick, and the fees to be paid are adjusted between the parties concerned either at a fixed rate or according to some percentage of the usual fee in that community. The government has insisted that the expenses of hospitalization are beyond the funds available, and hospital fees and specialistic care are not provided for under the F.E.R.A. Our F.E.R.A. differs from the British panel system only in the fact that the patient is completely taken care of with

funds supplied by the government whereas the British system collects something from the patient himself and from the employer. On the other hand, the F.E.R.A. provides for the wife and children as well as for the employed worker. The British panel system provides free choice of physician and our indigents are sent to physicians listed in order of listing.

Under the C.W.A. it is found that since these persons are government employees they are entitled to care for injuries or sickness arising through their occupation in government hospitals and by government physicians when such are available, but when not available arrangements are again made by the government with the local medical organizations. Thus again the state enters into medical practice, but of course with the understanding that these are emergency measures and are not to obtain if, as and when the emergency passes.

In all of these efforts of the government the medical profession has participated, realizing the existence of the emergency. No doubt the entire program has been in itself a sort of insidious propaganda for state medicine among the persons who received the benefit and among a considerable number of almost indigent physicians who have been enabled thereby to benefit somewhat their financial status.

The medical profession has, moreover, been lending itself in various ways in various parts of this country to innumerable other experiments in medical care. Contract practice, industrial practice, hospital insurance schemes, university practice, lodge practice and group clinics are a few of the many forms of medical care now available in various communities; and these simply could not exist without the services of some of the medical profession.

There are certain criteria by which scientists measure the results of various experiments. In consideration of many of these sociomedical experiments the scientific criteria have been waived or overlooked. It would be desirable to know first of all whether morbidity and mortality rates in communities where these experiments exist are lower than those in other communities in which the old form of medical practice prevails. Actually, however, no satisfactory scientific statistical data are available to show that sickness and death, even among the low income classes, are lessened after any of these plans for the distribution of medical costs are put into effect.

It is realized that advance payment covering the cost of sickness is likely to prolong the illness. It is realized that advance payment is likely to cause the patient to consult the physician much more frequently than he would otherwise. This very psychology in itself tends to invalidate much of the statistical data that are made available.

In European countries with compulsory health insurance schemes the amount of sickness has not been reduced. Moreover, the death rate, which is much more accurate, does not seem to be affected in any measurable manner by the introduction of these schemes or by any other method of paying for medical care. In fact, it is safe to say that the mortality and morbidity rates in the United States are as low as, or lower than, those of most civilized countries.

In reading a vast amount of literary material on this subject I have been struck repeatedly by the statement appearing in the papers of most of the socially-minded writers to the effect that medicine is proceeding in a stage-coach or on a bicycle while the world is traveling on an express train or in an airplane. Medicine has always been rather proud of its conservatism. If it had leaped at once to embrace all of the half-baked schemes that have been offered for changing the nature of practice, if it had hastened in its acceptance of thousands of theories of the causation of disease and of millions of panaceas and cures for various disorders, the effects on humanity would have been disastrous. Nevertheless, medicine points with pride to the fact that it has made more progress within the last fifty years than in all the previous years of its existence. As a result of this progress, increasing years of life have been conferred on most of civilized humanity, and the fear of pain, disease and death has been abolished. No doubt the very abolition of this fear has given the world the opportunity for most of the progress that it has made in other fields.

Nevertheless, with all of the progress that it has made, medicine is not yet ready to say to the world that it has standardized mankind. It still finds individual human beings so definitely individual in times of illness that they are not to be handled in the mass. True, even when they are handled in the mass it is possible to benefit ailing human bodies. But there is a great distinction between the quality of medical care that can be rendered to mankind in the mass and the quality that is given to an indi-

vidual. As I have said previously, medical care can be judged only on the basis of the quality of the service rendered.

It is conceivable that out of many of the experiments that have been made and that are being made, out of the scientific advancement of medicine itself, there may develop a greater and greater tendency toward discounting individuality in medical care. However, the scientific studies of recent years reveal no such tendency. We have seen instead in this period the growth of a method like psycho-analysis which requires the closest possible communion between an individual physician and an individual patient for hundreds of hours in order to get at the basis of a great deal of physical and mental disease. Under no system of state medical care is there provision for adequate psychologic investigation and mental hygiene.

We have seen in this period a reaction of the body of man to this new speed of civilization. A lowering of life expectancy at birth instead of a continued increase begins to reveal itself. Perhaps the machine age is bad for the health of man. Is it not conceivable that the great machine age in which we take such pride, that the great production in industry which seems to some men, to represent the apotheosis of the purpose of mankind in this world, represents a wrong philosophy of human life? The medical profession feels that the sick man is still an individual, a human being. Until it is convinced by properly controlled scientific data that its point of view is wrong, it is likely to continue to insist on the basic idea of personal relationship between doctor and patient as the necessary foundation for good medical care. It has shown repeatedly its willingness to work with economists, sociologists and statesmen toward schemes for making such individual medical care possible for the vast majority of our people.

DOCTORS, PATIENTS AND THE COMMUNITY *

By WILLIAM TRUFANT FOSTER, LL.D.

(Director of the Pollak Foundation for Economic Research, Formerly President of Reed College)

Dr. Cumming, Ladies and Gentlemen: I have listened, in the speech of the gentleman who preceded me, for a statement of the grave deficiencies in medical care which it should be the dominant purpose of this meeting to consider. No one would imagine, from any thing that he has said, that in this country at the present time there are millions of people with virtually no medical care whatever. No one would imagine that in this country, which leads the world in the profession of dentistry, there are not three persons out of ten whose teeth are adequately taken care of. No one would suppose, from anything that has been said, that in this country, which leads the world in preventive medicine, not one person out of ten has even one adequate, complete physical examination each year—and that, we must admit, is a prerequisite of preventive medicine; or that there are thousands of sufferers who eagerly want and need hospital care yet cannot get it, while one bed out of three in the private hospitals is unoccupied; or that a large proportion of our nurses are sitting at the telephone, waiting, in the hope that possibly they may get an opportunity to render the service they are eager to give, and which suffering humanity is eager to have.

Is there, ladies and gentlemen, no problem whatever of the economics of medical care?

It seems that I belong to that group which has just been scathingly referred to by the previous speaker—those who try to foment discontent with conditions as they are in the United States! I do belong to that group, and I am proud to belong to it. I would not care to belong to any group, in the medical profession, or in the teaching profession, or in the banking profession, or in any other profession, which is seeking to preserve things as they are.

The need for discontent is not confined to medicine. With a

* Condensed from stenographic report.

super-abundance of milk, we have malnutrition of infants. With a capacity which we are told is sufficient to produce three times as many shoes as we could wear, we have tens of thousands who cannot get shoes. What is the trouble? Everywhere we hear questions and answers which sound like the riddles of the mad hatter. Why must anyone go hungry? That is because we have produced too much food. But why must we go with shabby clothing? That, we are told, is because we have too much cotton, too much wool, too many cotton mills and woolen mills. Why these shabby houses? That's because we have produced too much lumber, steel, cement, too many tools, too many carpenters, plumbers, architects and contractors.

The whole story makes no sense. It ought to be called Alice in Blunderland!

Yet we hear the same story in the domain of medical service. When we ask why teeth are neglected, the answer is that we have too many dentists. When we ask why we have to go without nurses, we find it is because we have trained too many nurses. Nobody questions our ability to care for all who need care. We have the personnel and the equipment and the knowledge. If we could answer the economic riddle, we could render adequate medical service to our 120,000,000 people. Yet we do not do it.

The most obvious thing in this whole situation is that in the United States we possess everything that is necessary to solve the economic problem. Yet, as I listened intently to the interesting address of the previous speaker, I heard not a single constructive, large-scale proposal for attacking this problem. The problem before us is the physical well-being of a hundred and twenty million persons. We possess, I repeat, every material requisite for rendering these persons every needed care. We have the men and women, eager and able to serve. We have all the natural resources that we ever had. God has not gone back on us! We have the accumulated knowledge of the centuries. We have all the results of research in this great University and in all the others. We have, in short, everything that we need for solving this problem—everything except a large-scale, bold, constructive program for collective action.

Why, then, have we sat around these weary years, bemoaning our fate, and doing nothing about it? The answer is simple. In

the money and profit economy in which we live, producers continue to produce goods, employ men, order raw material, and build factories, as long as they can sell the product. They sell the product as long as people buy it. People buy it, as a rule, as long as they have the money.

Why, in this depression, have we not bought more? Mainly because the wherewithal to buy was crushed out of existence. With a money and credit system under the control of individual bankers, instead of under collective control, nine billion dollars of purchasing power were destroyed in two years. Nine billion dollars of wages, more or less, also disappeared. We do not have to look further for an explanation of the depression.

Yet money and credit are absolutely subject to human control. Dollars do not grow on bushes! Greenbacks do not grow on green gage plum trees! Every dollar that goes out of circulation goes out because some human being puts it out. Every currency is a managed currency. The only question is whether we shall manage our currency intelligently, or the way we have managed it in the last five years!

Why, then, have we failed? Mainly, I think, because we have been brought up for generations to believe in the theory of *laissez faire*. We have thought that the best thing we could do was to leave each 'rugged individual' alone to seek profits as he saw fit, and that somehow, beneficently, that would turn out to be the best thing for all of us. Everything is governed by natural law, and certainly it is sacrilegious to interfere with natural law.

It is easy to understand why this theory is popular. It lets everybody out. Nobody is responsible for natural law, so nobody has to do anything about anything; and some wise man, who had made some of those psychological studies to which the previous speaker referred, said long ago, "The most powerful impulse of the human race is the instinct to sit down."

Yet, in spite of the virtues of 'rugged individualism,' in spite of the natural desire to leave the job to the lazy fairies, the fact is that whenever a business depression starts in, and men are thrown out of work, and prices fall, and pessimism increases, every 'rugged individual' does exactly the wrong thing. Each 'rugged' consumer cuts down his buying; each 'rugged' short-seller creates panic on the stock exchange; each 'rugged' producer throws men out of work, curtails pay rolls, pays off bank

loans, postpones expansion of the plant; and everything he does makes things worse for all of us. In this situation, each 'rugged' banker hauls in the money and sits on it: that's what he calls "becoming liquid." So we go on, from bad to worse. In this condition, it is futile to rely on the individual, pursuing his own interests. The victory must come by collective action.

The initiative usually comes from outside the group, or from rebels within the group. That has been true of education. Progress has resulted mainly from the heresies of a few "wild-eyed radicals" among teachers, or has been imposed upon the schools by outsiders—consumers of education. What is true of educators is true of bankers. The American Bankers' Association opposed the introduction of the Federal Reserve System, because it was a change. Eighty per cent of the bankers opposed it. One year later, the bankers unanimously opposed any change in the Federal Reserve System, because it was a change. They are now having thrust upon them, by collective action inspired from outside their ranks, reforms which should have been made long ago.

The Stock Exchange likewise refused to make adequate reforms on its own initiative: reforms had to be thrust upon the Exchange from outside.

What is true of these professions is true of the rest. Lawyers, notoriously, are loath to take action which is not based on precedent. The principle of the dangerous precedent, as you know, is that we must not do an admittedly right and new thing today, because in the future it might be used as a precedent for doing a wrong thing. Therefore, nothing should ever be done for the first time.

Doctors, as a group, do not greatly differ in this respect from educators or bankers, or lawyers or, indeed, from the various industrial groups—the manufacturers of cotton cloth, for example, or manufacturers of leather, or the producers of oil, who found it impossible to initiate within their own group the action which, collectively, is now being taken for their good and for the common good.

But the Medical Association insists that "medicine has a right to control its own affairs." That evades the question. Of course, medicine has the sole right to control its own affairs, so far as they have to do with medical science. Everything that the preceding speaker has said on that subject seems to me beside the

point. He is putting up a straw figure and knocking it down with great gusto—and with humor. (We thank him for that!) But, after all, it is only a straw man. Nobody that I have heard of has proposed that the control of the science of medicine should be taken out of the hands of scientists. I have never heard anybody say that politicians should decide how soon a patient should be allowed to get up from an operation.

When, however, you interpret this demand, which I read again and again in the medical magazines, "Medicine has a right to control its own affairs"—when you interpret that to mean the *economic* aspects of medical care, that is another matter. Doctors have no special qualifications in that field; no right of eminent domain. We must draw this sharp line between the practice of medicine in its scientific aspects, and the economic means whereby individuals pay and doctors receive pay. Pray God that some day they may receive the pay which they deserve!

If 'rugged individualism' actually had succeeded in solving this problem, we might leave the matter entirely to the doctors; just as, if rugged individualism among the bankers had solved the problem of money and credit, we could safely leave the control of money and credit to the bankers. But in neither case has the problem been solved.

The report of the Committee on the Costs of Medical Care—discount it fifty per cent, if you want to—still would show that our tragic failure to use our available knowledge and services causes a vast amount of preventable physical pain and mental anguish, needless deaths, and economic waste. Present conditions call not merely for a little improvement here and there; they call for a far-reaching change.

The recent progress of the science of medicine has been little short of miraculous. Physicians and other men of science have shown an almost unparalleled professional spirit in making available for the benefit of mankind the results of their research. Physicians as a body, especially family doctors, have shown a willingness to risk their lives, and to serve suffering mankind, without regard to money rewards; indeed, they have rendered this service knowing for a certainty that, due to the chaotic economic condition of individual medical practice, a large proportion of patients would never pay bills. This is a record scarcely equalled by any business or even by any profession; and yet—I return to my first

point—and yet, in the distribution of the benefits of this amazing advance, medicine has made intolerably slow progress.

Under the prevailing form of medical service—private individual practice—more than fifty million persons in the United States either do not receive the care which they need, and with which they could readily be provided, or are heavily burdened by its costs, while many practitioners and agencies for health are underemployed and poorly paid. The barrier is mainly economic. It stands between the doctors and the dentists and the nurses who are able and eager to serve and the patients who are sorely in need of the service. Even in places where adequate medical care can be purchased, most of the persons in the lowest income groups do not get it. In spite of the large volume of free work, it appears that each year nearly half the individuals in the lowest income group receive no professional medical or dental attention. "Rugged individualism" has left us millions of far-from-rugged individuals.

What every sick person needs is a single agency, in one place, freed from every taint of commercialism, which will furnish him, through a general practitioner, preferably of his own choosing, all the necessary requirements.

The report of Hugh Cabot, which has just been referred to, seems to me beside the point. He says that in five of the countries he visited in Europe, he did not find medical care equal to that in the United States. Of course he didn't! It is also true that in the United States, even in the depths of the depression about a year ago, we had the highest standard of living of any country in the world. Were we satisfied with that? Of course we were not. The people of the United States, by an overwhelming majority, said so. We do not set our standards by those of any other country. The fact that we are better off than some other countries has nothing to do with the question. The question is how much better off we *could* be if we used our resources.

Again I say, we ought to be discontented, much more so than some of the leaders of the Medical Association seem to be, with the inadequacy of medical care in the United States; and the fact that conditions are worse in Russia or some other country has nothing to do with the question.

The problem is to bring doctors and dollars and diseases into such helpful and continuous contact with each other that the

practice of medicine can keep pace with the *science* of medicine. This can be done only by collective action. Medical services, both preventive and therapeutic, should be furnished, wherever consumers desire to try out the method, by organized groups of physicians, dentists, nurses, pharmacists and other associated personnel. Such groups might well be organized around a hospital for rendering complete home, office and medical care.

Everybody agrees that the form of organization should encourage the maintenance of high standards and the development and preservation of a personal relation between patient and physician.

The preceding speaker has promised you that I would offer a remarkable solution of the problem of medical care. I offer no solution. All I advocate is open minded approach to the problem: willingness to try, here and there, where the people want it, various plans for group practice and group payment, with the *economic* phases in charge of the public who pay the bills and who offer their bodies for the experiments, and with the physicians in complete control of the *medical* phases.

This is what the Committee on the Costs of Medical Care advocates in the report signed by the majority, including seventeen physicians, eminent in their profession, and twenty-two laymen, including men like Morris Cooke of your own City of Philadelphia, so distinguished for enlightened and unselfish social service that the results of their five years of labor, freely given, deserve more than contemptuous rejection, or attempts at humorous reading out of the records. And certainly, this work deserves more than misrepresentation. Yet this mild proposal of the majority of the Committee on the Costs of Medical Care—for voluntary action here and there, wherever groups of people desire to try it—this is called editorially, by the *Journal of the American Medical Association,* "socialism and communism—inciting to revolution."

It has been asserted, over and over again, that the administration of the economic phases of medical care by group payment precludes the precious personal relation between the patient and his family doctor. My first reply to that contention is that there are literally millions of sufferers in the United States today who do not now get adequate medical care, with personal relations or without them, by a family physician or by any other kind of physician. This is the chief problem of medical care: we must not be misled from the central issue by any detours.

My second reply is this: the Committee on the Costs of Medical Care propose, in the group plans, that each patient should be in charge of one general practitioner. There is nothing in this plan to prevent the best of personal relations. In fact, the personal relations under this plan might be even better than under the individual fee basis of medical practice; for—we may as well admit it—the greatest source of irritation between patients and doctors is, after all, the bills, and this irritation is removed by group practice, for bills are paid to the group on an insurance basis, and the physician is then free to devote himself wholly to the professional care of his patient. Yet the American Medical Association says that this method turns doctors into hirelings and treats patients like robots.

This noon I visited the Medical School of the University of Pennsylvania. Formerly each student in this School individually paid each professor, or he did not get any instruction. Now the School has group payment of the doctors. Has this destroyed the personal relation between doctor and student? Has it turned the doctors into hirelings and the students into robots? We know better. No professor of medicine in the United States wishes to return to the individual fee basis. We have had some humorous remarks about the man who gets a cinder in his eye. Must a doctor look at John Smith's eye as an eye belonging to the State, instead of to John Smith, merely because John Smith has joined with other consumers in an insurance plan which enables them to pay for the service when they get it? I cannot see that the method of payment has anything to do with the patient's eye or the way the doctor looks at it.

My "remarkable solution," which has been promised you, is simply that the costs of medical care, which are unpredictable in their nature, which therefore the average individual consumer of medical care cannot budget, should be placed on a group payment basis, wherever—again I say—wherever groups desire to try it, through the use of insurance or the use of taxation, or through the use of both these methods. And, mark you, this is not meant to preclude the continuation of medical service provided on an individual fee basis for those who prefer that method and can pay for it.

This mild proposal, however, is scorned by officers of the American Medical Association. They tell us that the report of

the Committee on the Costs of Medical Care is now languishing—to quote them exactly—"languishing into innocuous desuetude." They appear to me a "recalcitrant minority" of the profession, similar to the obstructive minorities which Mr. Roosevelt has deplored in certain industries. I have personal acquaintance with hundreds of physicians, and in my immediate family connections there have been nineteen. Virtually all the physicians whom I happen to know do not stand by the official position of the American Medical Association. I cannot bring myself to believe that the Association, in its present stand, truly represents the profession. I believe that the conflict is not between patients and doctors: the conflict is between reactionary doctors and progressive doctors. It is merely one phase of the war now being waged in every profession between those who imagine that we can still live in an economic age that is gone, and those who realize that we are living in a new economic age.

Fortunately, the progressive doctors are winning. The movement in the direction which I have indicated has already gone so far that it is only academic to debate about it. Since the publication of the Report of the Committee on the Costs of Medical Care, the State Medical Society of California has approved the plan, and group practice has spread all the way from Los Angeles to Seattle. In Portland, a very conservative city, 170 doctors are now operating under the plan which we advocate; in Seattle, over three hundred doctors. This year, the Medical Society of New Jersey has also approved it, and group hospitalization plans have been approved by the Medical Society of the State of New York, by the Cleveland Academy of Medicine, and in at least twenty-five cities. This has all happened since the report of the Committee on the Costs of Medical Care languished "into innocuous desuetude."

As your Chairman has said, I have been working in Washington for several months as a member of the Consumers Advisory Board; and so I know more about consumer attitudes than I did. Consumers at last are becoming articulate. They are going to demand, and they are going to get, the kind of treatment which they should have; because all industry, and banking, and transportation, and legal services, as well as medical services, exist only for the sake of the consumer. If we could only start with that proposition and keep it constantly before us, whenever we con-

sider what bankers should do, or what lawyers should do, we would be in a fair way to solve the problem. The trouble is we begin at the wrong end, instead of beginning with the consumer.

It is only yesterday, in the countless centuries of human history, that we took over the education of youth as a public responsibility. Before that, formal education was limited to those who could afford to pay for it. The private practice of education failed; and it failed through no fault of the private practitioners. Now, we all realize that the State, for its own protection, must require every one to go to school, whether or not he can pay the bills, and whether or not he wants to go. This is one of the fields in which individualism, however rugged, is not a sufficient protection of society.

This is equally true of medical care. For centuries we have relied mainly on individual initiative. For the most part, each individual has been left free to care for his health if he wanted to, or to neglect his health if he preferred to do that, or couldn't pay the bills. One result is the shocking condition of the rank and file of our citizens, as revealed by the physical examinations of the drafted men in our army and navy. Rugged individualism has failed. The private practice of medicine on an individual fee basis has failed to provide a large majority of our people with adequate care. This, I repeat, is through no fault of the private practitioners of medicine.

Yet health is not one of those personal matters with which we need not be collectively concerned. The health of the public is just as necessary for the safety of the State as is the education of the public. The analogy is sound in every essential. Perhaps that is the very reason why certain members of the medical profession vehemently object to any use of this analogy.

To assert that we cannot collectively try out plans for buying and paying for medical service without plunging the country into socialism and "inciting it to revolution" is nonsense. It ignores what we have already done collectively without socialism; we have achieved, as Dr. Sydenstricker pointed out this morning, a far better socialization of our water supply than Russia has, without achieving communism. Moreover, we have long had group payment and group practice of medicine for millions of indigent and tubercular and mentally diseased patients and others; and yet, after generations of such "dangerous" experiments in social-

ism, we gave last year only a handful of votes to even so eminently fit a Socialist candidate as Norman Thomas. Society must look forward to providing for health, eventually, on the same basis as education, or else we must leave the medical profession in its present plight, which even the chairman of the minority group of the Committee on the Costs of Medical Service says is very unfortunate.

In conclusion, I insist again that the previous speaker confuses the issue when he says that the right to say how medicine shall be practiced must remain with the medical profession. Nobody proposes that lay boards shall tell surgeons how to operate for cancer, or what to prescribe for pneumonia. Nobody suggests any interference with the science of medicine. On the contrary, the aim is to free the *science* of medicine from the present chaos of the *economics* of medicine. What the public does demand is the right to say, not how medicine shall be practiced, but how it shall be purchased and paid for; and who has a better right than those who do the paying? In any event, it is folly to burden physicians any longer with business affairs which they have notoriously mismanaged, for which they are not trained, in which they are not interested, and which interfere with that single-hearted devotion to patients which is the glory of their profession.

THE EVOLUTION OF THORACIC SURGERY

The Mary Scott Newbold Lecture XXXII *

By JOHN B. FLICK, M.D.

The art of healing is older than civilization. At first closely allied with religion and magic, it gradually emerged on firm ground, gaining from experience and eventually from the application of scientific discovery. The early practice of surgery, although limited in scope, probably had a sounder basis than that of medicine for the conditions with which the surgeon dealt were such that their very nature often suggested the remedial measure. Thus amputations for hopelessly injured limbs, the drainage of collections of pus, the control of external hemorrhages and the care of wounds were successfully accomplished. With the development of our knowledge of pathology and physiology new operations were suggested to fertile minds, but surgery in general made no great strides until after the discovery of anaesthesia and the application of the principles of antisepsis and asepsis. The development of thoracic surgery did not keep abreast with that of the abdomen and extremities, as a fear of opening the thorax held back progress even to a period within our own generation. However, certain operations upon the thorax were practiced by the ancients. Hippocrates opened and drained the chest for empyema and hydrothorax, and sometimes operated for affections of the lungs. Little was accomplished in surgery of the thorax, however, except in those instances where localization of the affection became evident by involvement of the chest wall and where, by virtue of such involvement, the surgical procedures became safe.

Vesalius in the sixteenth century demonstrated to his students the result of opening the chest of a living animal. He exposed the transparent parietal pleura through which the movement of the lung could be seen. As he broke this membrane the lung would fall away from the side wall, but the motion of the chest remained unchanged. As he made a wider exposure, and the

* Read April 4, 1934.

other pleural cavity was opened, the lungs would fall together and collapse. The cardiac motion could not be observed for long, since suffocation of the animal ensued. In order to restore the life of the animal, Vesalius made an opening in the upper part of the trachea and introduced a pipe of reed through which air was blown. He says "The lung should be inflated to the degree to which it occupied the thorax in life. The heart now gathers new strength and its motion will change beautifully. Therefore, by maintaining repeated inflation of the lungs, you may have the opportunity to examine the motion of the heart both by touch and sight as much as you desire."[1] He had thus demonstrated that artificial respiration would keep an animal alive after its chest had been opened, but the importance of his observation and the possibilities of the discovered fact were not appreciated. For centuries his demonstration of the great danger of opening the thorax was remembered, but his method of overcoming this danger was forgotten or at least was not associated with thoracic operations.

Acute and Chronic Empyema

The open drainage of acute empyema probably was the first operation upon the thorax to be more or less generally accepted, but it fell into disuse from time to time owing to a high mortality and various other measures were substituted for the relief of this condition. Aspiration was the common practice and remained so until after the time of Lister. The frequent incidence of chronic empyema, however, bore testimony to the failure to cure the acute disease, and led to the development of radical procedures for the relief of chronic empyema. Estlander in 1879 and Schede in 1890 advocated resection of the rigid outer wall of empyema cavities so as to allow the soft tissues to sink in and obliterate them. In 1893 Fowler and Delmore, mutually unaware of the other's work, developed the operation of pulmonary decortication. They removed the thick fibrous membrane overlying the lung and thus permitted the lung to expand. These operations often were mutilating, and carried with them a high mortality, but they were a great advance in thoracic surgery and established principles which today are used in the treatment of this condition. These formidable procedures, used in dealing

with chronic empyema, focussed attention on the necessity of improving the treatment of the acute disease.

Beginning as early as 1876 with the report of Cresswell Hewett,[2] various methods of continuous closed drainage or continuous aspiration were recommended. These methods scarcely differed except in unimportant details.

I shall quote what Paget [3] had to say, in 1896, concerning such procedures. "Nor need we consider the early attempts to combine drainage and irrigation with puncture; there was no efficiency in the combination of three inefficient methods; one cannot irrigate the pleura through an aspirating needle, or drain it with a narrow tube passed down the cannula of the trocar after puncture; the lotion stays in, the pus does not come out, the tube gets blocked, a fresh puncture is made, also in vain, and so the whole thing fails. But one method must be mentioned here, not because it is, in itself, very valuable, but because the controversy raised about it in Germany illustrates the whole subject of the treatment of empyema; and that is Bulau's permanent syphon drainage by means of a long rubber tube having one end in the empyema, and the other, at a lower level, in some antiseptic solution. The special claim made on its behalf is that it alone of all methods both keeps out the air, and also tends directly to promote expansion of the lung by a steady process of suction." Paget further says that the majority of surgeons agree that Bulau's method should be kept for exceptional cases, that it is tedious, uncertain, incomplete and not wholly free from danger.

The epidemic of hemolytic streptococcus infections of the respiratory tract associated with empyema, which ravaged the military camps of this country during the winter of 1917 and 1918, revived the controversy concerning open drainage. The high death rate during this epidemic, however, was not due to the employment of open drainage, but to its use too early in the course of the disease and to the virulence of the then prevalent infections. A difference between certain types of empyema exists, both in the pathology and in the clinical course, but the principles governing their treatment are the same. The experiments of Graham and Bell,[4] carried out during the World War, threw much light on this problem. They showed that "patients with pneumonia or with a beginning empyema were very likely to be killed by the injudicious use of an open drainage. The principal

reason for the deaths of such patients was the altered pressure relationships induced by an open pneumothorax. In an individual whose mediastinum is not stabilized, either by induration of the mediastinal pleura, or by the presence of adhesions between the lung and the chest wall, an alteration of pressure on one side of the chest is reflected to the other side to almost the same degree. The significance of this observation is that both lungs become seriously handicapped and that if the vital capacity is very low, as it is likely to be in any case of pneumonia, the additional embarrassment to respiration produced by the open pneumothorax is sufficient to cause death from asphyxia in many cases. As a matter of fact, the average mortality during the World War, until this principle was recognized, was close to fifty per cent.''[5]

It is now known that the mortality of acute empyema in any given epidemic depends upon the virulence of the infection and the occurrence of complications rather than upon details of treatment, provided the principles established by Graham and Bell are carefully followed.[5, 6] The average surgeon will do best to employ aspiration of the purulent fluid until the acute phase of the pneumonia has subsided and adhesions have formed and then to institute open drainage by the resection of a rib at a dependent part of the empyema cavity.

The Carrel-Dakin treatment of wounds, instituted during the World War, proved most effective in combating infection and was soon applied to the treatment of both acute and chronic empyema. The need for such mutilating operations in chronic empyema as those of Estlander and Schede has almost disappeared owing to the better treatment of acute emypema and the use of the Carrel-Dakin treatment in chronic empyemas. We seldom see the large chronic empyemas which were common when these operations were devised. Dakin's solution does two things, it sterilizes the cavity and acts as a solvent on the exudate, thereby facilitating expansion of the lung. The principles of the operations devised by Estlander, Schede, Fowler, Delorme and Ransohoff are still used, but the operations now employed for chronic empyema are not so formidable.

Anaesthesia for Intrathoracic Operations

Operations for intrathoracic conditions formerly were fraught with danger because of disturbance of respiration and circulation

when the chest was open. Progress therefore was dependent upon some method of maintaining inflation of the lungs during the course of the operation. This problem was attacked by a number of American surgeons, among them Fell, O'Dwyer, Northrup and Matas,[7, 8] who proved the possibility of respiration by the rhythmical insufflation of air into the lungs. In 1893 Fell described an apparatus that he had successfully employed for maintaining artificial respiration in cases of opium poisoning. His method was identical with that employed in laboratories to carry on respiration in animals by forcing air into the lungs through a cannula inserted in the trachea or by means of a mask applied over the mouth and nose. The danger of tracheotomy and the inefficacy of the mask were soon overcome by another American of inventive genius, O'Dwyer, who substituted an intubation tube for a tracheotomy cannula. In 1899 Matas[7] remarked, "O'Dwyer's resurrection of Bouchut's crude ideas on intubation, and his magical transformation of the bloody and tragic picture of tracheotomy in diphtheria into a simple painless and bloodless bit of technical jugglerly by his perfected method of intubation, has practically closed for all time one of the most conspicuous chapters in the history of surgery. By similarly transforming the tracheotomy cannula of the Fell apparatus to an intubation tube he unconsciously but fittingly opened to surgery a new chapter of greater interest and promise than that which his previous achievement had brought to a close." The value of this apparatus was made apparent by Northrup, who described it as the Fell-O'Dwyer apparatus and demonstrated its great usefulness as the simplest and most effective appliance then known for maintaining artificial respiration (Matas). In 1904 Sauerbruch in Germany constructed a negative pressure chamber. This was attacking differential pressure from a new angle. The patient's head remained outside and a tight rubber ring was fitted about his neck. His body, inside the cabinet, was subjected to a pressure slightly lower than atmospheric. In 1909 Willy Meyer in this country built a cabinet on a more elaborate scale. He combined a positive pressure chamber for anaesthetic purposes with a negative pressure chamber which functioned as an operating room. These cumbersome chambers have passed into history, their place having been taken by the simpler positive pressure apparatus, but they helped to establish principles and

it is quite possible that the future may see their return. In 1910 intratracheal insufflation anaesthesia was suggested by Meltzer and Auer.[9, 10, 11]. This consisted in the introduction deep into the trachea of a flexible elastic tube, the diameter of which was much smaller than the lumen of the trachea. Through this tube, a stream of air was driven which returned through the space between the tube and the walls of the trachea. Ether vapor added to the air resulted in anaesthesia. Elsberg developed an apparatus with which this type of anaesthesia was used with excellent results. While intratracheal anesthesia is still used, the more generally accepted form of differential pressure is now attained by using a tight fitting mask and introducing the anaesthetic vapor or gas under moderate positive pressure. By this method the lung can be inflated at will.

War Injuries of the Thorax

The World War furnished an opportunity on a grand scale for study of chest injuries. The vast majority of patients with penetrating wounds of the chest, either in civil or military surgery, do not require operation but there remains a small group who will die unless operated upon. During the war much of the fear of opening the thoracic cavity disappeared. Wide incisions were made, injured tissue resected and foreign bodies removed. The wounds in the chest were closed or only a suction drain left in the pleural space. Pneumothorax was reduced to a minimum and with it the mortality of thoracic injuries. The importance of not permitting an open pneumothorax to exist for any length of time was recognized to the extent that even at advance dressing stations "Sucking wounds" of the chest were closed either by suture or packing before the patient was moved back to a station where he could be operated upon.

Pulmonary Abscess

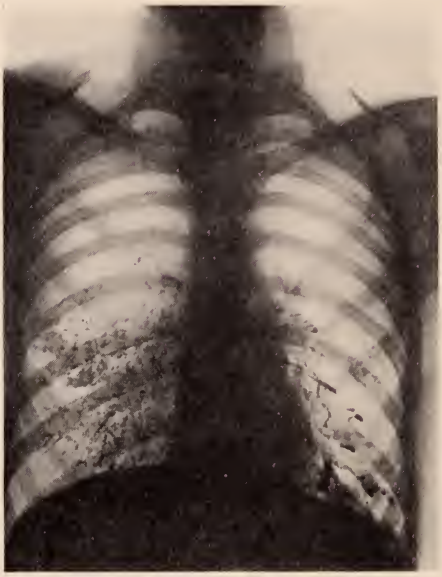
It is difficult to trace the history of the surgical treatment of pulmonary abscess. This operation, like that for empyema, has been practiced sporadically in different parts of the world since the time of Hippocrates but until recent years was regarded as a highly dangerous procedure, only to be employed when death seemed imminent. Until modern diagnostic methods became avail-

able it was difficult or impossible to make an accurate diagnosis and cavitation of the lung due to abscess was commonly confused with tuberculosis. Advance in the treatment of pulmonary abscess came with improvement in x-ray technique and the use of the bronchoscope. Not only is the bronchoscope of therapeutic value, but it is of use in determining the presence of some local condition in the bronchus which might be an etiological factor. It also permits of localization of the disease process to a lobe and exact localization is of the utmost importance in planning exposure of the abscess in those cases selected for surgical treatment.

The use of local anaesthesia and the practice of operating in stages reduced the operative mortality of pulmonary abscess. If the pleural surfaces are not adherent, gauze is packed against the parietal pleura and the opening of the abscess delayed until firm adhesions have formed. This prevents pneumothorax and avoids infection of the pleural cavity. An additional advance was made with the adoption of wide exposure and the use of gauze packing in the abscess cavity instead of tube drainage. Unless a widely opened abscess cavity is packed with gauze the patient cannot cough effectively and rid the bronchi of material which if retained might cause septic foci to develop elsewhere in the lungs.[12] In a personal series of twenty-nine patients operated upon prior to 1929 and reported in that year nine patients (31 per cent) made complete recoveries. Three additional patients recovered with bronchial fistulas. This made a total of twelve patients or 41 per cent who were able to return to work. There were ten deaths in the group of twenty-nine patients (34 per cent). This mortality may seem high but in every case other methods of treatment had been tried, often over a long period of time and of the patients in this group all probably would have died without surgical operation. One half of the deaths occurred from intracranial complications.[13]

Bronchiectasis

The literature on the subject of the surgical treatment of bronchiectasis dates back to 1873 when Mosler proposed incision and drainage of a bronchiectatic cavity. Later, Lenhartz, Quincke, Garré, Körte, Tuffier, Brauer and others devoted much thought to the disease and furthered its treatment in original ways.[14] The operation of bronchostomy or pneumotomy, now



(a)

(c)

FIG. 1. (*a*) Bronchiectasis of a left lower lobe. X-ray made after the introduction of lipiodol. (*b*) The same patient. Photograph of the specimen, consisting of the left lower lobe, removed at operation. (*c*) The same patient. X-ray of the chest made six weeks after removal of left lower lobe.

obsolete, advocated by Mosler, did not adequately drain the many bronchial dilatations and the trend of surgery, therefore, led away from incision and drainage as a treatment for bronchiectasis. Therapeutic collapse of the lung, at first devised for the treatment of pulmonary tuberculosis, came to be used for the treatment of unilateral bronchiectasis. Hedblom [15] in 1931 reported a number of patients treated by thoracoplasty, sixty per cent of whom had shown improvement. However, it is obvious that in most cases any procedure short of removal of the diseased tissue will not be curative. Hence excision of the involved lobe has long been the aim of surgeons in the treatment of this condition. "Meyer stated in 1914 that sixteen cases of pneumectomy for bronchiectasis had been reported, of which eight recovered, were cured or improved, and eight died. He reported a successful case in 1915, and Lillienthal, in 1916, reported seven cases, with four cures and three deaths. Robinson in 1917 reported five cases of complete resection of the lower lobe with one death." [16]

FIG. 1 (*b*).

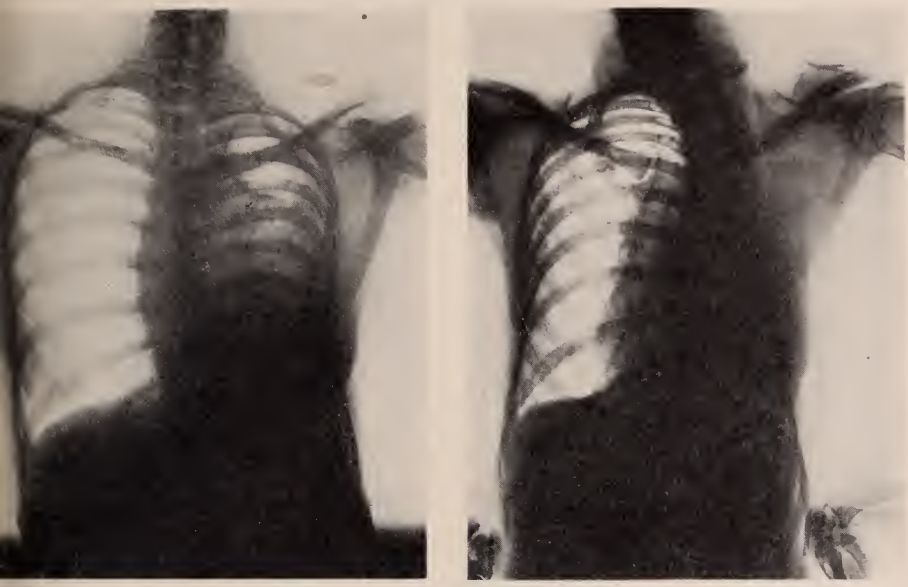
Other authors reported cases from time to time, but the mortality in the aggregate, until recently, remained excessively high. Brunn[17] in 1929 reported six cases with four cures, one improvement and one death. Shenstone and Janes of Toronto modified Brunn's technique, and in 1933, Janes[18] reported the results of sixteen lobectomies for bronchiectasis done by a one-stage method. Of these sixteen cases, six were cured, three were improved, two unimproved and five died. The explanation of the unimproved cases is that the disease was more extensive than was realized before operation. Alexander[19] in 1933 reported eighteen total lobectomies done in stages with three deaths (17 per cent). Only the last six patients had the benefit of the fully developed technique, and none of these died. The entire lung has been removed for bronchiectasis by Nissen[20] of Berlin and

FIG. 1. (*d*) The same patient. Photograph showing the line of the incision for removal of the lobe and the absence of deformity from operation. Patient apparently cured.

by Haight [21] of Ann Arbor, Michigan. In both cases the lung was allowed to slough out after ligation of the hilus.

The operative mortality of lobectomy in the last decade has been greatly reduced and there is every indication that with further experience it will fall even lower, comparing favorably with that of other operations for equally serious conditions. In the advanced form of bronchiectasis with pneumonitis and multiple bronchiectatic abscesses, cautery pneumectomy as advocated by Graham [22] in 1925 is probably the operation of choice.

Obviously not all patients with bronchiectasis are suitable cases for radical surgical procedures. It is safe to say of the advanced cases that many of them at some time during the course of the disease would have come within the sphere of radical surgery had an early diagnosis been made. The pioneer work of Chevalier Jackson in diagnostic bronchoscopy and of Jackson,[23] and Lynah and Stewart,[24] in mapping out the bronchial tree by means of injecting opaque substances, has been invaluable to the surgeon in gaining exact knowledge as to the nature and location of lesions of the bronchi and lungs. Visualization of bronchi is particularly valuable in the early diagnosis of bronchiectasis.



(a) (b)

FIG. 2. (*a*) Chronic pulmonary tuberculosis. X-ray showing large cavity in left upper lobe. (*b*) Same patient after thoracoplasty in multiple stages and secondary reaction of regenerated upper ribs. Cavity apparently obliterated.

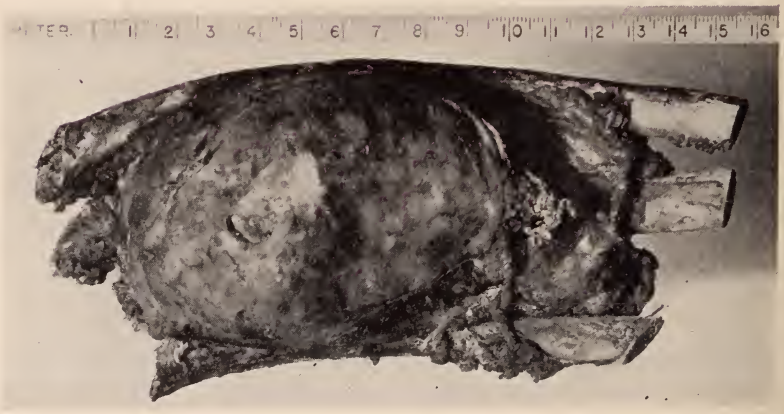
With early diagnosis and with improvement in the technique of operation, a greater number of cases of bronchiectasis will be found suitable and will be subjected to lobectomy.

Pulmonary Tuberculosis

One of the outstanding achievements in thoracic surgery has been the development of the surgical treatment of pulmonary tuberculosis. James Carson of Liverpool should be given the credit for having laid the foundation upon which the structure of modern pulmonary compression is built.[25] In 1821 he urged the production of artificial pneumothorax in the treatment of pulmonary tuberculosis. Forlanini of Pavia in 1882 also proposed the use of artificial pneumothorax and he was the first to practice and develop it. The idea was suggested to him as it was to Potain, by the well known favorable influence that benign pleural effusions and spontaneous pneumothorax sometimes have upon cases of largely unilateral pulmonary tuberculosis.

(a)

(c)



(b)

FIG. 3. (*a*) Osteochondroma of the fourth rib, right side of chest. X-ray of chest showing the tumor. (*b*) The same patient. Photograph of the specimen, consisting of tumor, third, fourth and fifth ribs removed at operation. (*c*) The same patient. X-ray of chest taken one month after operation.

IG. 3. (*d*) The same patient. Photograph taken showing the line of incision and the slight deformity from operation.

The first attempts to relax the tuberculous lung, by an operation upon the over-lying bony cage, were made by de Cerenville of Lausanne in 1885. Brauer was the first to realize that clinical success depended upon obtaining a pulmonary collapse somewhat comparable in amount with that obtained by artificial pneumothorax, which already was affecting remarkable cures and improvements. Brauer felt the need for an operation that could be used when artificial pneumothorax failed because of pleural adhesions and that would affect the scattered smaller active tuberculous lesions as well as the localized larger ones. Therefore, in place of the limited resections that had been practiced hitherto, he proposed removal of the entire lengths of ribs from the second to the ninth inclusive, so as to obtain rest for the lung and an actual pulmonary collapse rather than a mere relaxation. This operation was undertaken by Friedrich on December 11, 1907. The patient survived the operation and fourteen months later his tuberculous condition was greatly improved. Brauer and Friedrich soon modified the technical details of this operation. The

periosteum and intercostal muscles were left intact as hernia of the lung was common when they were removed. Later it was found necessary to resect the first rib. The tenth rib was also removed to increase the effect of the operation upon the lower lobe. Friedrich in 1911 reported twenty-seven cases with eight deaths within the first three weeks following operation. The shock was terrific. The side of the chest operated upon, being deprived of all its bony support, swung in and out freely with the respiratory movements—the so-called paradoxical respiration —and the object of the operation was defeated (John Alexander). At present Friedrich's operation is obsolete, having been replaced by less dangerous procedures which give excellent results. Sauerbruch began his work under Friedrich in the Marburg Clinic and in 1909 performed a paravertebral thoracoplasty.

Wilms of Heidelberg in 1911 demonstrated clinically the value of rib resections limited to the paravertebral region. This operation had a greater healing effect upon tuberculous lesions of the lung than any of the previous operations, yet it avoided the dreaded dangers of the Brauer-Friedrich procedure. The modern operation was developed by Sauerbruch and consists of resection of the ribs posteriorly as close to the transverse processes of the vertebrae as possible, from and including the first rib down to and including the eleventh rib. The periosteum is left in order that bone regeneration can occur and give stability to the chest wall. Most surgeons now do the operation in at least two, frequently three or four, stages. Sauerbruch advocated resection of the lower ribs first, but the majority of surgeons today prefer to remove the upper ribs at the first stage. When large cavities exist in an upper lobe it is now common practice to remove the upper ribs anteriorly as well as posteriorly and, in some cases, to take away the costal cartilages. Experience has taught that only by the most extensive resection of rib and cartilage can these great cavitations be closed.

Outside of Central Europe, popularization of surgical collapse in the treatment of pulmonary tuberculosis was slow. It is of interest to those of us who are Philadelphians to learn that in 1911, Robert G. Le Conte, at the Pennsylvania Hospital, performed a thoracoplasty for pulmonary tuberculosis (Pennsylvania Hospital History No. 2771). The patient was a young woman with extensive disease of an upper lobe and was referred

from the Henry Phipps Institute. Elsberg demonstrated the use of his new anaesthesia apparatus at this operation. The resident physician records that Le Conte removed one and a half inches of each rib from the first to the eighth, just left of the posterior median line and the patient was discharged from the hospital improved. Edward Archibald of Montreal was probably the first on this continent to draw attention to the very encouraging results obtained by European surgeons in the treatment of unilateral pulmonary tuberculosis by surgical methods. In 1914 he read a paper on "Extrapleural Thoracoplasty" before the National Tuberculosis Association reviewing the work of Sauerbruch and others and reporting two cases of his own. He has continued to contribute to the literature of this subject and to him goes much credit for the wider employment of this method of treatment in the English speaking world. Good results are now obtained by thoracoplasty in properly selected cases. In a personal series of thirty-two patients operated upon prior to 1933 twenty-four or 75 per cent were definitely improved by the operation.

Section of one phrenic nerve with resulting paralysis of one-half of the diaphragm was proposed in 1911 by Stuertz for lower lobe tuberculosis, especially with cavitation, and for bronchiectasis. Shortly after this, Sauerbruch practiced phrenicotomy without knowledge of Stuertz's proposal. This operation did not always result in satisfactory phrenic paralysis which led Felix in 1922 and Goetze in the same year to propose more radical procedures as a substitute for simple section. The latter operations aim to interrupt the accessory phrenic nerve or nerves and anastomosing sympathetic twigs as well as the main phrenic trunk. As a result the diaphragm is more completely paralyzed (John Alexander). Recently phrenicectomy has become quite popular in the treatment of pulmonary tuberculosis and bronchiectasis. In tuberculosis it is used alone or in combination with artificial pneumothorax or with division of intercostal nerves [26] or with thoracoplasty.

Experimental work done on dogs has shown that paralysis of a hemidiaphragm may interfere with elimination of material from the affected lung.[27] Clinical experience has indicated the desirability of only a temporary paralysis in certain cases. This is accomplished by crushing the main trunk of the phrenic nerve and dividing any accessory branches. If a permanent paralysis

seems desirable, this can be obtained at a second operation by avulsion of the main trunk of the nerve as proposed by Felix.

In 1913 Jacobaeus of Stockholm devised an ingenious technique to sever adhesions which prevent complete collapse of the lung in patients undergoing artificial pneumothorax treatment. The adhesions to be divided are sighted through a thoracoscope, introduced into the pleural cavity through an opening in one intercostal space, and are then severed with a galvano-cautery, which is introduced through another intercostal space.

A Mütter Lecture of the College of Physicians of Philadelphia was given by Jacobaeus [28] in November of 1921. He reported the results in fifty patients upon whom he had operated, dividing adhesions by his method. A successful result was obtained in thirty-five patients. Jacobaeus and others have developed this operation further in recent years and it now has rather extensive use. The high frequency current has replaced the galvano-cautery originally used with the result that the field of vision is not obscured by smoke.

Tumors of the Chest Wall

Tumors of the chest wall, lungs and bronchi, and mediastinum have not escaped attention. Tumors of the chest wall do not occasion the same technical difficulties in their surgical removal as do intrathoracic growths and hence they were the first to be successfully removed. In 1899, Parham [29] of New Orleans wrote an exhaustive article on "Thoracic Resection for Tumors Growing from the Bony Wall of the Chest," reviewing fifty cases collected from the literature and adding two successful cases of his own. Of his first case, operated upon in 1897, he says "So sudden was the pneumothorax and so striking were the manifestations of profound shock, threatening almost instant dissolution before our eyes, that I resolved to acquaint myself more thoroughly with the dangers of thoracic surgery and to study the resources of our art for successfully dealing with such emergencies as are born with the sudden, accidental or intentional, opening of the pleural cavity." When he operated upon his second case in 1898, he used the Fell-O'Dwyer apparatus and was the first to demonstrate the value of this apparatus in maintaining respiration during operations of this kind. In his second case there was little disturbance during and after the operation in contrast

to the stormy manifestations of his first operative attack on a tumor of the chest wall. Modern positive pressure anaesthesia and better methods of combating shock have made removal of tumors of the chest wall, unless of great size, a comparatively simple procedure. (See Fig. 3.)

Primary Malignant Tumors of the Lungs and Bronchi

Primary malignant growth of the lungs and bronchi were exhaustively dealt with in a monograph on the subject published by Adler [30] in 1912. Lenhartz had already operated upon several cases of cancer of the lung, and in one case, by removing the affected lobe in its entirety, prolonged the patient's life for a year and a half. The following is quoted from Adler's monograph and is of interest in the light of our present knowledge "There is every reason to hope that the technique of this new branch of surgery will be still further developed and that in the near future thoracotomy and operations on the lungs will be attended with no more risk than are peritoneal operations today. If this is so, a new and great responsibility is placed upon the shoulders of internal medicine. It will be necessary, not only to educate the opinion of the laity so as to induce them to submit to these operations with the same readiness with which they now submit to peritoneal operations, but it will also be the sacred duty of the physician to recognize these cases and to recognize them as early as possible. The physician must be imbued with the conviction that malignant pulmonary disease occurs much more frequently than is commonly believed and that he may meet it any day in his practice among the young, as well as among the old. As at present the conscientious physician examines every chest for possible tuberculosis, so in the future every chest will have to be examined for possible tumor. The writer would go still further. When all the means of diagnosis outlined in this little study fail, where there is suspicion of tumor, but no assurance is possible, there should be—it is emphatically here stated—as little hesitation in resorting to an exploratory thoracotomy as there is nowadays in submitting to an exploratory laparotomy."

In an extensive review of the literature in 1933 Carlson and Ballon [31] discussed the reported cases in which surgical removal of carcinoma of the lung had been accomplished or attempted. In all there were six cases in the literature in which a patient

survived the operation and was well at the time of the report, a year or more later. Two of these patients were operated upon by Sauerbruch,[32] one by Churchill,[33] two by Tudor Edwards,[34] and one by Allen and Smith.[35] In Churchill's case the lower and middle lobes of the right lung were successfully resected. In 1933 Graham [36] of St. Louis operated upon a physician who was suffering from a squamous cell carcinoma of the left upper lobe bronchus and removed the entire left lung together with many of the tracheo-bronchial mediastinal glands in a single operation. This apparently is the first case on record in which total removal of the lung for carcinoma was successfully accomplished and marks an epoch in thoracic surgery. Later in the same year, Rienhoff * of Baltimore did a total left pneumonectomy for fibropapilloma of the left primary bronchus in a child and a total left pneumonectomy for carcinoma of the left bronchus in an adult. Both of these patients were operated upon at a single stage, access to the lung being obtained through an intercostal incision only and both patients made good recoveries. In Graham's case, a partial thoracoplasty was done at the operation for removal of the lung but Rienhoff did not consider a thoracoplasty necessary. Later x-ray examination of the child operated upon by Rienhoff showed the right lung to have undergone compensatory emphysematous changes and to have enlarged sufficiently to push the heart and mediastinum to the left chest wall, completely filling the space left by the removal of the left lung. Primary neoplasms of the lung and bronchus are now within the realm of surgery. It remains only to recognize these conditions early, before the growth has become too extensive or metastases have developed.

Tumors of the Mediastinum

Mediastinal tumors are being recognized more frequently due to improvement in thoracic diagnosis, especially with the x-ray. A large percentage of mediastinal tumors are benign, but all are potentially malignant and should be operated upon if not too far advanced. The tumors that remain benign may reach an enormous size causing death by pressure on important structures in the mediastinum. In 1932 Harrington [37] reported a series of thirty-eight cases of intrathoracic new growth which he removed by operation. Twenty-three of these were in the anterior or pos-

* Cases shown at the meeting of the Society of Clinical Surgery, Baltimore. November 3, 1933.

terior mediastinum. Microscopical study disclosed that eighteen (78 per cent) were benign tumors and five (22 per cent) were malignant. There were only three operative deaths in twenty-three cases; a remarkably low mortality considering the seriousness of the condition, and a tribute to the skill of the surgeon. Harrington says "Cases of benign tumor are the most gratifying from a surgical standpoint, for the risk is not great if the tumors are removed before they have become so large as to cause pressure on the surrounding structures. If the patient survives the operation, complete cure is obtained. The frequency with which these tumors become malignant is the most significant indication for their early surgical removal. Because of the difficulty in establishing a definite clinical diagnosis, I believe that exploration should be made in all cases, unless the clinical evidence is that a hopeless, inoperable condition exists."

Carcinoma of the Esophagus

Diseases of the thoracic esophagus so far have not been dealt with successfully by radical surgical measures except in rare instances. Eggers [38] in 1933 reported the results of nine cases of carcinoma of the thoracic portion of the esophagus upon which he operated. In only five of the patients was it possible to remove the tumor and complete the operation. Of the five patients in whom the tumor was successfully removed, three died within the first three days, and two recovered, living seven and one-half and eighteen months respectively. Both of the patients who recovered from operation subsequently died from carcinoma. That carcinoma of the thoracic portion of the esophagus can be successfully removed is proven by Torek's patient who was living and well eleven years after operation. Torek [39] in 1913 removed the thoracic esophagus and connected the cervical esophagus with the gastrostomy opening by means of a rubber tube. Most patients with carcinoma of the esophagus are referred to the surgeon late in the course of the disease, after they have become emaciated and dehydrated and with the local lesion too far advanced for complete removal. Patients who complain of difficulty in swallowing, be it ever so slight, should be studied with all the means at our disposal, especially the x-rays and esophagoscope. While resection of the esophagus will always remain a formidable operation, some of the technical difficulties have been mastered, and

with early diagnosis and prompt operation better results will be achieved.

Wounds of the Heart

Surgery of the heart and pericardium furnishes an interesting chapter in the history of medicine. After the time of Morgagni, the founder of pathological anatomy, who died in 1772, clinical and pathological observations on cardiac conditions became more accurate and the symptoms of injuries and diseases of the heart became better known. Morgagni observed that a puncture of a coronary artery on the external surface of the heart might cause such an amount of hemorrhage into the pericardium as to compress and arrest the heart's action. This was the first indication that surgical evacuation of the fluid within the pericardial sac might relieve the heart from compression.[40]

Baron Larrey [41] in 1798 was the first to deliberately remove fluid from the pericardial space. In 1871 Callender [42] removed a needle from the heart and this probably is the first recorded case of human heart injury in which anything surgical was attempted. The first successful experiments of making a wound in the heart of an animal and then closing it by suture was performed by Del Vecchio [43] in 1895. In March of 1896 Farina [44] sutured a dagger wound in the left ventricle of a man and the patient lived several days. Rehn [45] in September of the same year sutured a stab wound of the right ventricle and this was the first case to completely recover following suture of the heart for injury. In 1868 Fischer [46] collected 452 untreated cases of heart wound and found that only 10 per cent recovered. In 1909 Peck [47] collected 160 cases treated surgically with 37 per cent recoveries. During the World War, Hartmann [48] and others succeeded in removing bullets from the ventricles of the heart and the patients recovered. In recent years the mortality rate of wounds of the heart treated surgically has been markedly lowered. Bigger [49] in 1932 collected fifty-three reported cases of wound of the heart operated upon after 1926. In this series 74 per cent of the patients recovered.

Purulent Pericarditis

The first successful pericardiotomy for purulent pericarditis was done by Hilsmann [50] in 1844, the second by von Langenbeck [51]

in 1850 and the third by Rosenstein [52] in 1879. Notwithstanding these cures the medical profession was loath to advise drainage of the pericardial sac in the presence of pus. Cases have gradually accumulated in the literature and have been periodically collected and reported. Beginning with Hilsmann's case, Winslow and Shipley [53] reviewed the literature to May, 1927, and reported ten new cases. Bisgard [54] reviewed the literature for the next four years and added two cases of his own to those already reported. Up to May 1931 there was a grand total of 171 cases with 77 early deaths, a mortality of 45 per cent, and 94 recovered. The operation of pericardiotomy is a simple procedure which can be done under local anaesthesia, but the great problem is to recognize the condition clinically. It is chiefly in this direction that we must look for advancement in the treatment of acute purulent pericarditis.

Chronic Valvular Disease of the Heart

The relief of chronic valvular disease of the heart by surgery has been attempted by Cutler [55] and others with some slight success. The idea was first voiced by Samways [56] in 1898 who suggested that "with the progress of cardiac surgery some of the severest forms of mitral stenosis will be relieved by lightly notching the mitral orifice." A few years later Sir Lauder Brunton urged his surgical colleagues to such an attempt (Cutler and Beck [57]). Doyen [57] in 1913 and Tuffier [58] in 1914 were the first to operate for the relief of stenosed valves. Doyen's case died a few hours after operation and Tuffier's case recovered and was improved. Tuffier did a finger dilatation for aortic stenosis. Cutler in 1923, using a tenotome which he inserted into the left ventricle, attempted to incise each cusp of the obstructing mitral valve. This patient lived four and a half years and undoubtedly was better after the operation.

Later Cutler and Beck devised an ingenious instrument with which they could excise a segment from the valve and remove it from the blood stream. This instrument was used in five cases. In 1932 they collected twelve cases in which operation was done for chronic valvular disease of the heart including seven operated upon by Cutler. The mortality was 83 per cent. The three patients who survived operation, one case of aortic stenosis, and two of mitral stenosis, were improved. Two of these were treated by

the method of finger dilatation. Cutler believes that mitral stenosis offers greater promise than do any other of the valvular lesions. The employment of surgery in the treatment of this condition, of course, involves the acceptance of the idea that mitral insufficiency is a far less serious condition than mitral stenosis. Cutler and Beck call attention to the possibility that a sudden change from a stenosis to an insufficiency may be responsible for failures and suggest that a more gradual transition, if such can be attained, might achieve better results.

Adhesive Pericarditis

Of recent developments in thoracic surgery one of the most interesting and spectacular is the relief of symptoms in "Pick's disease" by surgical operation. The essential pathologic change in Pick's disease is a fibrous thickening of the pericardium which limits the normal diastolic expansion of the heart. The symptoms arise chiefly from the marked venous stasis and resemble those of chronic congestive heart failure.

Weill [59] in 1895 predicted that this type of adhesive pericarditis would one day come within the province of surgery. "Three years later (1898), the operation of decortication of the lung gave Delorme the idea that the same principles could be applied to the heart encased in an adherent pericardium. . . . Delorme pled for the adoption of his proposed operation in numerous communications addressed to the clinical societies of Paris. His proposals met with slight favor, however, and in 1902 the simpler procedure designed by Brauer was announced from Germany. Cardiolysis by the simple resection of ribs and costal cartilages gained popularity, and the theoretical principles so carefully worked out by Delorme were discarded as being unnecessarily hazardous for clinical application" (Churchill). Rehn [60] in 1920 was the first surgeon to report the results in cases in which an excision of a portion of the pericardium had been carried out. Sauerbruch, however, "as early as 1913 had freed the heart and resected a portion of the pericardium in a patient who had been confined to bed by dyspnoea and who showed general edema. The patient was reported as being symptom free and able to work eleven years after operation" (Churchill). Churchill [61] in 1929 in an excellent article on "Decortication of the Heart (Delorme) for Adhesive Pericarditis" reviewed the

subject and added to the list reported a successful case of his own. Beck and Griswold [62] in 1930 produced Pick's syndrome in dogs by injecting Dakin's solution into the pericardial cavity. They subsequently obtained a symptomatic cure in these animals by pericardiectomy. Beck and Griswold also reported a successful pericardiectomy on a human being. It was not until these papers appeared that any great interest was shown in this country in the surgical treatment of Pick's disease. Churchill collected from the literature, chiefly that of Germany, thirty-seven cases in which an operation was performed for adhesive pericarditis. In five of these cases the operation was interrupted. There were seven deaths directly attributable to the operative procedure or 22 per cent of the cases in which operation was completed; two patients showed no improvement; in four cases the improvement was transitory and the patient died of the original disease; in the nineteen remaining cases (59 per cent) the result was excellent, and frequently there was almost complete relief from symptoms. Three of the patients in the latter group died of intercurrent disease.

Embolism of the Pulmonary Artery

Trendelenburg's bold and brilliant operation for removal of a gross embolus from the pulmonary artery has met with a number of successes. Kirschner [63] in 1924 was the first to have a patient recover after this operation. Meyer [64] in 1927 and Crafoord [65] in 1928 each reported two cases of embolus of the pulmonary artery successfully operated upon. Meyer [66] reported his fourth successful case in 1931. The technical difficulties of this operation apparently are not great, yet success is rare. The explanation lies perhaps in the difficulty of establishing a definite diagnosis, in the patience required in awaiting the proper time for surgical interference, and in the absolute necessity of a previously drilled team to speedily carry through the procedure. The operation must not be done too early before it is obvious that death will ensue without interference, nor too late when the patient is beyond resuscitation.

Many other thoracic operations have been developed which time will not permit us to review. Among them may be mentioned sympathectomy for the relief of the pain in angina pectoris [67] and for the control of intractable asthma.[68]

It will be seen that surgery of the intrathoracic organs has made rapid progress during the present century. Pathologists, physiologists, and pioneers in research surgery laid the foundation, and today, thoracic surgery is well established. The names of Murphy, Tuffier, Brauer, Sauerbruch, Trendelenburg, Meyer, Jackson, Archibald, Graham, Alexander, Cutler, Churchill, Beck and many others will go down in medical history as pioneers in this development. Thoracic surgery, no longer in its infancy, promises before many years have passed to reach a plane equal to that which has been attained in surgery of the abdomen.

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ABSTRACTS OF THE PROCEEDINGS OF THE COLLEGE JANUARY TO MAY, 1934

January 3

Hereditary Constitutional Peculiarities and Dietary Deficiencies. The James M. Anders Fund Lecture. By Wade H. Brown, M.D. (*From the Laboratories of The Rockefeller Institute for Medical Research.*)

Diets deficient in vitamines give rise to characteristic pathological conditions in man and animals but little is known concerning variations in individual dietary requirements or variations in the response to dietary deficiencies due to individual peculiarities.

Study of an animal population (rabbit) has shown, however, that on a standard diet which is entirely adequate for certain family groups, other groups will show unmistakable evidence of a dietary deficiency, the manifestations of which vary with different family groups; thus indicating a fundamental and apparently specific variation in vitamine requirements or in the ability to perform certain nutritional functions.

Experimental tests have shown that these nutritional peculiarities are inherited and that the expression of a given fundamental deficiency, such as in the nutrition of bone, may be varied by localizing or distribution factors which are also inherited. In each case, two kinds of individuals can be recognized: first, the transmitter; and second, the subject of the inherited abnormality. Under ordinary conditions, individuals of the first type are apparently normal but they are potential subjects of disease and their susceptibility to dietary deficiency is demonstrable. Individuals of the second class usually develop outspoken manifestations of disease at an early age, regardless of dietary conditions; they may be improved by treatment but in most instances the inherited disease is lethal.

From these studies, it becomes apparent that due to the circumstances of inheritance, a given nutritional defect may be expressed in a variety of forms other than those now recognized as deficiency disease. It is also apparent that especial importance

is to be attached to the carriers of deficiency genes; they not only transmit a liability to disease but they constitute a peculiarly susceptible element of the normal population and are in reality the subjects of latent or potential disease.

March 7

The Gorgas Memorial Laboratory and Problems Engaging Its Attention.* By Herbert C. Clark, Director, Gorgas Memorial Laboratory, Panama, R. de P.

In 1924 a site of ground located on the sea coast of Panama City was presented by President Porras of Panama to the Gorgas Memorial Institute of Tropical and Preventive Medicine, Incorporated. This is an American corporation having for its purpose the work of education along sanitary and health lines, and especially the study of tropical diseases and methods of prevention. The Gorgas Memorial Laboratory is the tropical subdivision of the Gorgas Memorial Institute. Our organization possesses a fine building and enough ground on which to expand.

We occupied our quarters in January, 1929. We have no hospital under our supervision but the courtesies of such institutions in Panama and the Canal Zone are extended to us. We have been extremely fortunate in adding a Veterinary Station where research work on large domestic and wild animals can be studied under quarantined conditions. Six temporary rural stations in various parts of Panama have been in use at intervals to supply our needs in the study of the major problems as well as in the study of the wild animal life.

Our charter permits us to study anything included in the diseases of plants, animals or human beings. Malaria control and equine trypanosomiasis are the two major features receiving attention. We have a small permanent staff, a staff on tour of duty from the Army, Navy and Public Health Services, and visiting scientists from other institutions who can find local material for the problems they have under consideration.

Thus far we have had 20 visitors for periods of one to three months from eight Universities: Johns Hopkins, Chicago, California, Tulane, Harvard, Yale, Rochester and Cornell. In addition to these sources of assistance we have at all times the important cooperation available from the various Services within

* Editorially condensed.

the Panama Canal Zone and the Republic of Panama. The Museum of Comparative Zoology at Harvard, the Bureau of Animal Industry in Washington and the Medical Department of the United Fruit Company have been of great assistance. Small sums from private sources have assisted in developing the library and Veterinary Station.

Our organization has just closed its fifth year of work and during that time 47 publications have been made or are in process of publication by the staff and visiting scientists on subjects investigated in the laboratory or its rural stations. Most of these studies fall under the head of protozoology, helminthology, mammalogy and zoology. Most of the so-called tropical diseases can occur in the temperate zones and as air, land and sea travel develop, reducing the transportation periods to shorter and shorter intervals, there will be a higher incidence of these so-called tropical diseases in the temperate zones. Only experience will tell us whether you have there important local vectors for these diseases.

Malaria: We consider malaria the disease of greatest economic importance to business operating in the lowlands and river valleys in our tropics. The Caribbean negro has a higher tolerance to this disease than the mainland native yet his labor efficiency, in exposed lowland agricultural regions, will probably not exceed 60 per cent if left under unsanitated conditions and without medical care. We know what the Panama Canal Zone has done and continues to do in the way of malaria control but few realize the difference in performing such work in the Canal Zone as compared to the regions operated by private tropical fruit companies, oil companies, etc. At the close of the construction period of the Panama Canal it was possible to reduce the force and to concentrate it at the terminal cities and at the lock sites. A private agricultural organization of such magnitude as the tropical fruit companies must, however, meet the following conditions: (1) Their personnel must be widely spread out through vast plantations in lowlands that cannot afford to be too thoroughly drained if the fruit is to thrive. This means favorable anopheline breeding places. (2) The degree of discipline is limited. (3) A wide radius of mosquito breeding control is too expensive in large plantations. (4) Screened labor quarters would be too expensive and would require good police protection to insure proper use and maintenance.

It was believed that with the close of the construction period in the history of the Panama Canal the cost of maintenance in mosquito control would gradually fall due to the permanent obliteration of water surfaces and to drainage. It now proves that as a result of the presence of the artificial bodies of water known as Gatun Lake and Miraflores Lake the need for mosquito control will increase rather than diminish so that the control of malaria must be approached as something to be indefinitely continued. Conditions can increase the range of flight of anopheline mosquitoes to a far greater distance than we would have admitted some years ago. Consideration of the cost of mosquito control and of mosquito proofing of quarters render many of the usual antimalaria measures impractical for the labor masses. It occurred to us that something of importance might be accomplished by attacking malaria control in labor camps as a dispensary disease rather than as a hospital disease or as a large sanitary problem. It seldom happens that the *human seed bed* of malaria is attacked as a whole. Sick people go in for treatment but the vast majority of laborers harboring malarial parasites never get sick enough to force them in for treatment yet they are below par as labor and furnish reservoirs of infection for the mosquito. To study this problem over a period of years it was necessary to have a body of such people living in an exposed location. Permission was granted us to use five native villages on the banks of the Chagres River between the boundary of the Canal Zone and the new Madden Dam now under construction. These five villages are without mosquito control of any character and the houses are mostly made of thatched roof, cane walls and dirt floors. They are in the midst of large anopheline breeding beds. We use as controls two other native villages on the Madden Dam Highway and in addition the personnel employed at the Madden Dam. These people at the Dam are supplied mosquito proofed quarters, short radius mosquito control and compulsory monthly blood film surveys followed by compulsory treatment of those showing malaria parasites. We are making monthly thick-blood-film surveys of all the people mentioned and treating with the new drugs atebrin and plasmochin, all found positive for malaria at our examinations. We have gradually reduced the parasite rates in these villages [1] during the past four years to about one quarter of the rate found on the original blood survey (60 per cent); but we are finding it difficult to make further reduc-

tion by this means alone. Most of the people caught in the monthly surveys now consist of the same individuals month after month. They seldom show evidence of illness other than a low hemoglobin index. The group of children is receiving special attention but without much success to date. We hope to find a compromise method of control that can be expected to be applied with a prospect of a return in labor efficiency that will meet the financial outlay. The ultimate hope is to reduce as low as possible the chance for mosquito infection from carriers and then perhaps add a short radius of mosquito control about camps. Also included in our malarial problems are studies in anopheline flight, biting experiments with new species of anophelines, trapping experiments and a study of monkey malaria. We do not consider monkey malaria transferable to man but the animal and its malaria supply good material for research. Details are in our published reports by Dr. Wm. H. Taliaferro.[2]

Trypanosomiasis: Trypanosomal infections are not uncommon in wild animal life but most of these are of a harmless form. The opossum and armadillo are frequently found carrying *T. cruzi*,[3] and sometimes other animals show it. We have now seen 12 human cases of *T. cruzi* infection (Chagas's disease) but none of them have proven to be harmful infections and were found accidentally in routine blood-film surveys. Quite recently a 13th case was found in an 18 months old child that died without medical attention. Dr. Elbert DeCoursey, pathologist, at the Board of Health Laboratory, Ancon, Canal Zone, found Chagas's disease to be the cause of death in this case and will soon report it in detail.

Our only form of trypanosomiasis that has great economic importance is due to *T. hippicum* which produces a fatal disease in horses and mules. This disease is known locally as *murrina* or *derrengadera* and was first found and scientifically described by Dr. Samuel T. Darling[4] in 1910 in the Panama Canal Zone. It is a disease that corresponds closely to the equine trypanosomiasis of the Philippines. Undoubtedly the disease had existed on the Isthmus for a long time if we can base our opinion on the clinical manifestations. It was always considered uniformly fatal to horses and mules and ran a course of from a few weeks to several months. In late years a number of trypanocidal drugs have been placed on the market, but we find tartar emetic the best, although very toxic when given alone in large enough dosage to kill the

parasites. With Bayer 205 (naganol), a highly recommended drug, we have experienced too many relapses when this drug is used alone. We now use [5] for horses and mules over 600 lbs. in weight, 8 grams of naganol and 21 grains of tartar emetic divided into three doses. Each dose is dissolved in 200 cc. of distilled water and injected into the jugular vein by gravity. There is an interval of six days between doses. Occasional relapses occur and then further treatment is given. We now feel that we can cure from 50 to 60 per cent of the cases if treatment is started before the late stage of the disease.

Ever since Darling's report on the disease we have been seeking for reservoirs of the disease and for a natural vector. Insect life has been investigated with particular attention to the species of horse fly but no form of transmission other than by mechanical means had been found until Dunn [6] began studies with the vampire bat, *Desmodus rotundus murinus* Wagner. He proved that this bat could acquire the disease by feeding on an infected horse or guinea pig and that after an incubation period of six to eight days its blood films became positive for trypanosomes. The disease proves fatal to the bat about one month after the parasites are found in its blood. The appetite of the bat, as is the case with the horse and mule, is not impaired by the disease. It is, therefore, capable of feeding nightly on one or more animals. A meal of blood for this bat in captivity will average about 16 cc. This fact should make it possible for them to infect themselves from relatively light carriers of the parasite.

An extended search has been made of wild and domestic animals for unharmed carriers of this infection and has indicated that the most important animal carriers commonly found in close contact with the equine stock are cattle.[7] About 4½ per cent of the cattle ranging with horses and mules and tested by guinea pig inoculations where the disease is endemic have been shown to harbor the parasite. In addition, the domestic hog, sheep, goat and cat can carry it over long intervals as well as the two local species of deer and the collared peccary. Adequate protection from bats can be provided by illuminating the stables either by electricity or by clean oil-lanterns. The owner of a large herd of range animals that cannot be stabled over night and that range with cattle is confronted with a more serious problem. Dunn [8] has been able to prove not only the vampire bat a vector for *T. hippicum* but also at least three reduviid bugs as local vectors of

T. cruzi in Panama: *Triatoma geniculata* Latr., *Rhodnius pallescens* and *Eratyrus cuspidatus* Stal.

Relapsing Fever: Our study of wild animal life in regard to trypanosomiasis and malaria afforded an accidental discovery of the spirochete of relapsing fever in a wild monkey [9] of Panama. We were able to transmit the organism to human beings through ticks as well as by direct inoculation. We have since found this spirochete [10] and others closely allied to it in the following animals: marmoset monkey, opossum, armadillo, cattle and horse. Dunn's [11] work on the tick vectors of this disease is noteworthy.

Our laboratory has increased knowledge concerning the larval stage of *Dermatobia hominis* [12] and concerning conveyors of the eggs of this fly. This worm infesting the skin is of great economic importance to the cattle industry and has some importance in human medicine. Some new ticks [13] and mosquitoes [14] have been described but their importance to medicine has not yet been determined. The work of the year now in progress will be largely connected with the further study of rural inhabitants of the type from which tropical labor is drawn in order to find their health index and what can be done to advantage and within financial reason to increase labor efficiency. Studies in malaria control will be continued.

We are already forced to admit that the *construction period* of the Panama Canal and the *period of operation and maintenance* present different problems in regard to exposure to malaria and the practice of anopheline control. During the first period the Canal Zone was practically uninhabited except along the railroad and contact villages on the border were few and small. Sanitation was confined to a narrow strip along the railroad and about the villages with an average radius of mosquito breeding control of about 200 yards. We were all inside screened quarters by the time the sun went down because there were no places for entertainment outside the homes and club-houses. There was no Gatun Lake nor Miraflores Lake.

The period of operation and maintenance began with a great reduction in the number of employees and these were concentrated in the terminal cities of the Zone and about the lock sites. This we thought would reduce expense of sanitation particularly when so many breeding grounds were gradually being obliterated by permanent drainage and filling operations. Two new features have appeared that developed trouble. First, an Act was passed

that threw open to settlers almost the entire limits of the Canal Zone, whereas it was not within financial reason to apply the usual method of mosquito control to those widely scattered farmers and border towns. Second, Gatun Lake [15] and Miraflores Lake are now permanent bodies of water and the former contains 165 square miles of surface with a changing surface elevation that varies about six feet between flood season and dry season. This gives a shore line that varies with the seasons from about 1,000 miles to 1,200 miles. This lake has not given trouble as a breeding place for anopheline mosquitoes until recent years. The kind of aquatic growths that existed along the shore did not favor anopheline breeding; but now new plant life has crowded out the old species of plants and the present growth does favor anopheline development on one side of the lake during the last few weeks of dry season. It is a massive breeding bed at that season. Where did the new plants come from and how did the anopheline mosquito get its start in these remote arms of the lake? We do not know but we suspect migratory water fowl may have brought in the seed of these plants in their alimentary tract and perhaps egg mats of mosquitoes on their feet, bill and plumage. The very discouraging feature is that we suspect that the flight from this massive breeding bed, taken by interrupted night flights, is long enough to reach the terminal points of the Canal Zone during a month or two at the close of dry season. This means in a direct line, a flight of 15 or more miles. The settlers are abundant and scattered along these lines of flight and blood surveys average a parasite index of about 25 per cent. This provides opportunities for mosquito infection. Our old thoughts on the question of anopheline flight were anchored to a 200 yards idea, later a mile, then two miles and now under special conditions we are open to the belief that a flight of 15 or more miles can happen. We are making trapping experiments from this vast breeding ground to the terminal cities to collect facts on this suspected flight. It is also of interest to note that three species [16] of anopheline mosquitoes are being found around the lake shore that never were there before and these must be tested for their ability as vectors. Our new segment of the international highway system is already encouraging the protected inhabitants of the Canal Zone to make long week-end automobile excursions outside the sanitated area and additional cases of malaria in employees that have been ac-

quired outside of the Canal Zone are recorded by the Health Offices.

Dárien Station: This station is located in the province of Dárien at tidewater level on the banks of the Tuira River and in the village of El Real. Dárien is the province in contact with Colombia on the Pacific coast. The station has been in charge of Lt. Comdr. Paul W. Wilson, M.C., U. S. N. It was his desire to follow his extended study of yaws in Haiti with a comparative study of the disease in Panama. He studied and treated 447 cases during the period from July 1932 to the end of September 1933. His report on "Atypical Yaws"[17] will soon appear. We found here an endemic focus of filariasis that had not been previously recorded for Panama. This problem was placed in the hands of Dr. O. R. McCoy[18] who identified the parasite and reported it as *Microfilaria ozzardi.* This parasite has not been found in other parts of Panama. It is the same form of filariasis found just across the border in Colombia. This station has been of assistance in the snake census that we are helping the Museum of Comparative Zoology at Harvard to carry on. We have shipped 2133 snake-heads from nine lowland locations of Panama and among them were 582 of the poisonous species or an incidence of 27.2 per cent. Our annual report[19] for 1933 will analyze this census.

We trust that the Gorgas Memorial Laboratory, a philanthropic, pioneer outpost in tropical medical research will become a large center such as the Western Hemisphere deserves. It should be able to assist in the protection of the Panama Canal and our own country against the influx of diseases that might gain a foothold and, finally, it should be able to form a new bond of contact with Latin America. If the tropics are to be permanently entered by large private industries under the management of the white race there is much to be accomplished to make it safe for the race.

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May 2

Total Ablation of the Normal Thyroid in the Treatment of Patients with Chronic Heart Disease. By Herrman L. Blumgart.

Treatment of chronic heart disease by complete removal of the thyroid gland was undertaken in the hope that restitution of certain normal physiological relationships would accomplish clinical improvement. In patients with intractable congestive heart failure, the blood supply is inadequate for the metabolic demands of the tissues. In angina pectoris, the available coronary blood supply is not sufficient for the needs of the heart. By inducing hypothyroidism with its lowered metabolic rate by means of total thyroidectomy, the discrepancy between tissue needs and blood supply is abolished and these two important fundamental factors are brought into proper relationship. Many aspects of the problem of treating patients with chronic heart disease by complete removal of the normal thyroid gland have now been investigated. It may be well at this time to present an abstract of some of our results.

Of 40 patients operated upon for congestive heart failure, 22 have maintained their compensation 2 to 17 months after operation; 5 had temporary recurrent decompensation and at present are well and active; 6 died at 1 to 11 months subsequent to operation; 2 showed no improvement; and 5 are too recently postoperative to evaluate the extent of the clinical improvement. All of the 22 patients who have maintained compensation are either working or able to work.

A survey of the results in 20 patients with angina pectoris shows that there was marked improvement in 13 patients, who have now gone 2 to 17 months postoperatively. They have had no anginal attacks and have required no nitroglycerine. In 4 patients there was moderate improvement; in 3, little or no im-

provement. There were no operative or subsequent deaths in this group.

In a series of 60 patients, 6 operative deaths have occurred. All of the deaths occurred during the period of our earlier experience in patients with advanced congestive heart failure. On the basis of our present criteria for the selection of patients for operation, 4 of these patients undoubtedly would be denied this therapeutic measure, because their congestive failure was so severe that only moderate improvement was evident after prolonged bed rest and diuresis. Postoperative pulmonary complications, as disclosed by autopsy, were the cause of death in all 6 cases. The last 30 consecutive patients have been operated upon without mortality.

The operation, we believe at present, should be undertaken only in patients who in spite of every available treatment have failed to maintain improvement and are incapacitated. Patients with angina pectoris are by far the better operative risks, for they usually show no evidence of decompensation; patients with status anginosis or angina pectoris complicated by attacks of cardiac asthma are more serious risks. Patients with congestive failure must be selected with great care. Removal of the thyroid gland presumably does not alter the underlying cardiovascular pathology. If the underlying pathological process is rapidly progressive, it will probably continue to be so after operation, and the patient will obtain improvement over only a relatively short period of time. Patients who give a history of recent, rapidly progressive disease are therefore unfavorable subjects. In this category are included patients with malignant hypertension, patients with short, rapidly progressive histories of congestive failure due to arteriosclerotic, hypertensive or rheumatic heart disease. Patients with syphilitic cardiovascular disease similarly are unfavorable subjects. The operation should not be undertaken in the presence of active pulmonary infection, or in the presence of clinical evidence of active rheumatic infection. Patients who show low renal function or nitrogen retention are poor operative risks. Before operation, it is of the greatest importance to keep patients at complete rest in bed until the signs of congestive failure disappear so that operative complications will be minimized. Most of our postoperative deaths have been in patients who in spite of long preoperative care have nevertheless

shown evidence of congestive failure as indicated by râles at the bases of the lungs, enlarged liver and signs of peripheral edema. Operation should be undertaken only after the patient's condition has been improved to the fullest possible extent.

Experience has shown that a basal metabolic rate of less than minus 15 per cent prior to operation is an unfavorable factor, and that the operative procedure is probably contraindicated when the metabolism is below minus 20 per cent. Success after total thyroidectomy predicates the presence of at least some reserve on the part of the weakened heart. The patient who preoperatively shows lack of such cardiac reserve, as manifested by failure to show improvement with complete bed rest and digitalis, is a poor operative risk and will probably not be greatly benefited by the operation. An ideal subject for this procedure is one who loses all signs of congestive failure at rest in bed, but regularly shows evidence of decompensation when he deviates from this regime; the patient has a basal metabolic rate above minus 10 per cent. In such a patient, a lowered metabolic rate may result in striking clinical improvement, with the capacity for reasonable activity and usefulness without return of failure.

Earlier in this work gas-oxygen anesthesia, with adequate preliminary sedative therapy, was employed. The use of local anesthesia in a few of the patients with severe hypertensive heart disease with congestive failure proved so satisfactory that it has since been generally adopted. The results in the last 30 patients thus operated upon have been so satisfactory that we unhesitatingly recommend it as the anesthesia of choice in practically all cases.

The surgical technic and the particular operative precautions that must be observed have been described elsewhere by Dr. David D. Berlin who is responsible for the surgical studies in relation to this problem. The danger of injury to the recurrent nerve is especially important; likewise great care must be exercised to preserve the parathyroid glands with their blood supply intact.

A routine examination of each patient for clinical signs of developing tetany is made at frequent intervals each day during the first postoperative week. At the time of each examination the patient is directly questioned concerning the presence of sensations of numbness or tingling. If signs or symptoms of tetany are elicited, calcium chloride solution (8 cc. of 35 per cent solu-

tion every 3 hours) is administered orally. Viosterol, 250 D, is also given in 0.5 cc. doses. If signs or symptoms persist, calcium medication is increased; calcium chloride solution intravenously (10 to 20 cc. of 10 per cent) occasionally may be indicated. Medication is gradually reduced, and omitted when the signs of parathyroid insufficiency remain absent.

In the first 60 cases operated upon, 10 patients developed some of the signs or symptoms of parathyroid insufficiency. No case with spontaneous carpopedal spasm or convulsions was encountered. In 9 of these 10 patients, parathyroid insufficiency was transient, all clinical signs and symptoms disappearing within the first 2 postoperative weeks. One patient, now 9 months postoperative, still requires calcium medication by mouth to control mild symptoms of hypoparathyroidism.

The postoperative treatment demands the same careful supervision that all patients with heart disease require. In addition, the level of metabolism in each patient must be carefully regulated. Without thyroid medication, we have found that practically all patients will eventually develop extreme myxedema, with weakness of the legs, emotional irritability and mental slowing. By the administration of small doses of thyroid daily, practically all patients can be maintained at a metabolic level of minus 25 to minus 30 per cent, at which level these untoward signs and symptoms are controlled. This metabolic level, while freeing patients from the untoward signs and symptoms of myxedema, nevertheless requires less work on the part of the heart and releases this organ from much of its previous burden.

Current Conceptions of the Nature of Rheumatic Fever.

By Homer F. Swift. (*From the Hospital of the Rockefeller Institute for Medical Research, New York.*) (*Abstract.*)

The word rheumatism from long usage has become synonymous with the idea of pain in the joints, muscles and nerves. Many diseases have been included in this general category; but, with the demonstration of the bacterial causation of infectious diseases, it became evident that arthritis and myositis were often complications or sequellae of specific infections. Because no definite micro-organisms have been demonstrated as causing rheumatic fever, the custom has arisen in many quarters of designating arthritic complications of bacterial infections as "rheu-

matoid'' or ''pseudo-rheumatism.'' The term ''rheumatoid'' here is used in a different sense than when it is applied to chronic rheumatoid arthritis.

The subsitution of the term rheumatic fever for acute articular rheumatism reflects a changing concept of the nature of the malady; and many of its features emphasize the chronicity of the underlying process. The protean nature of the disease is now well established on the grounds of both pathological and clinical evidence. The importance of vascular as well as cardiac involvement is becoming well recognized; and the multiplicity of characteristic histopathological lesions in the nasopharyngeal zone and in the neighboring lymphatics emphasizes the importance of this area of the body in the development of the disease.

At least three phases in the evolution of the histopathological lesions are now recognized: 1. Acute toxic, characterized by edema, fibrinoid swelling or focal necrosis of the mesenchymal ground substance, and accompanied by accumulations of wandering cells. 2. Granulomatous, characterized by the proliferation of cells probably from undifferentiated elements of loose connective tissue; Aschoff bodies and subcutaneous fibroid nodules are typical examples. 3. Scar formation. All three stages may be found simultaneously in the same organ. Because of similar pathological findings in arthritis deformans, some observers claim that the two conditions are closely related.

Rheumatic fever is usually considered to be definitely infectious in nature. Many writers think the infectious agent is a virus; but so far numerous attempts to test this hypothesis have yielded only negative results. Recent claims that the pathogenesis rests upon a tuberculous background have been unsubstantiated, both because of an absence of tubercle bacillus bacteremia, and of a lack of positive tuberculin reactions in most patients having the disease. On the other hand, the occurrence of erythema nodosum in both tuberculosis and rheumatic fever suggests that comparable factors may be operative in both conditions.

The theory that streptococci play a part in the induction of the disease is quite commonly accepted. This has rested, in part, on the isolation of non-hemolytic streptococci from various rheumatic products, and, in part, on the close relationship between rheumatic valvular disease and subacute bacterial endocarditis. Evidence has been adduced, however, suggesting that the invasion

of the blood stream by these micro-organisms is due to an increased permeability of the mucous membranes in various diseases where these structures are abnormal; and this appears to be the case in rheumatic fever.

Recently, the possible causative role of hemolytic streptococci has attracted much attention. This goes back to the old observation of the precursory relationship between tonsillitis or nasopharyngitis with the onset of rheumatism. Coburn, Collis and others have shown that hemolytic streptococci are the only types of bacteria that increase in number in the upper respiratory tract with a subsequent onset of rheumatism. An increase in other types was not followed by this disease.

Todd and others have demonstrated antistreptolysins in the blood of patients with rheumatic fever of the same intensity as that formed by patients with known hemolytic streptococcal infections. Coburn and Pauli, and Schlesinger and Signy have detected precipitins against hemolytic streptococcal nucleoproteins in the blood serum of rheumatic fever patients about the time of appearance of rheumatic symptoms. Other observers have, however, noted similar antibodies in the blood of patients with other diseases; hence neither antistreptolysins nor precipitins against streptococcal fractions can be regarded as uniquely or specifically characteristic of rheumatic fever.

Most patients with rheumatic fever evince allergic reactions with certain streptococcal products. Substances elaborated into broth cultures of non-hemolytic streptococci have induced a fairly high percentage of reactions; but so-called Dick toxins from hemolytic streptococci induce reactions in about the same proportion as would be expected in a normal group of similar age distribution. Streptococcal nucleoproteins, on the other hand, induce a high percentage of positive reactions; those prepared from hemolytic streptococci are stronger in this respect than are those from non-hemolytic strains. While many non-rheumatic individuals show positive reactions with these proteins—probably because of having suffered from streptococcal infections—it has been shown that rheumatic children give a much higher proportion of positive reactions than do a normal group of a similar age.

Schick described three phases in scarlet fever: first, toxic; second, quiescent; third, allergic. Most of the rheumatic compli-

cations of scarlet fever occur in the third phase. Similar phases are found in non-scarlatinal streptococcal infections followed by rheumatic fever; e.g., tonsillitis or pharyngitis, latent period, stage of active rheumatism. Lyttle has observed that most patients with hemolytic streptococcal infections have transitory evidence of renal disturbance during a period corresponding to the third phase.

The arthritis of serum disease superficially resembles that of rheumatic fever; and its intensity is roughly parallel to the concentration in the patient's blood of precipitins against the protein inducing the serum disease. Reasoning from analogy it might be predicted that a comparable antibody might be found in the blood of rheumatic patients; in the case of scarlet fever Schick applied the term "ergin" to this hypothetical substance. The demonstration of antistreptococcal precipitins in the serum of rheumatic patients has suggested the possibility that these antibodies might be the hypothetical "rheumatic ergins." If this view is accepted, no explanation has been advanced to explain the absence of rheumatic manifestations in the many patients suffering from streptococcal infections and having in their serum much precipitin; and, conversely, why many patients with very active rheumatic symptoms have no precipitins.

Klinge and his co-workers have observed in rabbits injected with large amounts of horse serum lesions resembling those found in rheumatic subjects; i.e., fibrinoid swelling of the mesenchymal ground substance, granulomata, and scars. Other pathologists deny that these granulomata compare closely with rheumatic proliferates. The view has been advanced, however, that the tissue injury results from a union of antigen and antibody. If we accept the postulate that the injury to the tissues in rheumatic fever is due to the union of some antibody with a substance produced by streptococci we are still in the dark as to the particular antibody involved, for antibodies have been demonstrated against the following streptococcal products: erythrogenic toxins (so-called Dick toxins), streptolysins, fibrinolysins, nucleoproteins, a somatic carbohydrate (so-called C substance), a type-specific protein (so-called M substance). Streptococci also elaborate a number of toxic products, which may possibly be responsible for the tissue injury.

When the rheumatic syndrome appears the streptococci seem to have been deprived of some of their virulence, either because

they have undergone some transformation or because in the body of the patient there has developed a partial resistance. This resistance, however, is apparently not sufficient to rid the body entirely of the streptococci, for they remain viable in the lymph nodes, tonsils or other tissues for long periods. In this semi-parasitic state they doubtless have the capacity of helping to maintain an allergic state. *If* it is eventually demonstrated that streptococci are the *only* causative agents in rheumatic fever we shall have to accept the conclusion that this disease is a "rheumatoid condition" in the same manner as we regard gonococcal rheumatism as "rheumatoid." One must, nevertheless, remember that streptococci may play only a contributory role, and that the essential underlying factors are, as yet, unknown.

No matter how one may regard the ultimate role of streptococci he cannot disregard the following phenomena: previously rheumatic subjects who contract a streptococcal infection are five or six times as liable to suffer an attack of rheumatic fever as are non-rheumatics who contract similar streptococcal infections. This suggests that by applying suitable prophylactic measures we would probably prevent many rheumatic relapses; and these measures should be enforced wherever rheumatic fever subjects gather. Another possible line of attack is to attempt to alter the reactive state of these individuals' tissues so that when they come into contact with streptococci they do not develop this disease.

This review indicates that many of our concepts are the bases for hypotheses to be tested, in order that ultimately we may arrive at a true understanding of the nature of this disease.

PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY, JANUARY TO APRIL, 1934

(*These proceedings will appear in abstract in the Amer. Jour. Ophthalmol. and in the Archives of Ophthalmol.*)

January 18

Dr. A. G. Fewell: "Hole at the Macula." Exhibition of Case.

Dr. Alfred Cowan: "Iridescent Crystals in the Crystalline Lens." Discussion by: Dr. Zentmayer.

Dr. George Cross: "Ankyloblepharon and Symblepharon Corrected by Epidermal Skin Grafts with Silver Conformer." Exhibition of Case.

Dr. Leighton F. Appleman: "Prism Exercises for Insufficiency of Convergence." Discussion by: Dr. Buchanan, Dr. Shipman, Dr. Zentmayer and Dr. Brav.

Dr. W. I. Lillie (by invitation): "Arterial Grooving of the Optic Chiasm Associated with Pituitary Tumors." Discussion by: Dr. deSchweinitz, Dr. Holloway and Dr. Lillie.

February 15

Dr. C. E. G. Shannon: "Divergent Paralysis." Discussion by: Dr. Burris and Dr. Zentmayer.

Dr. Burton Chance: "Conservative Treatment of Massive Cystoid Following Extraction." Exhibition of Case.

Dr. Hunter W. Scarlett: "Occlusion of the Central Retinal Artery." Discussion by: Dr. Zentmayer, Dr. Holloway, Dr. deSchweinitz.

Dr. Alfred Cowan: "Ophthalmic Symptoms in Brain Abscess." Discussion by: Dr. Holloway, Dr. Zentmayer, Dr. deSchweinitz.

March 15

Dr. Chapin Carpenter: "Traumatic Anterior Pyramidal Cataract Adherent to the Cornea." Discussion by: Dr. Cowan and Dr. Zentmayer.

Dr. E. A. Shumway: "Non-pigmented Naevus of the Caruncle."

Dr. T. B. Holloway and Dr. H. A. Wentworth (by invitation): "Some Preliminary Studies Concerning Hemianopsia."

Dr. R. H. Peckham (by invitation): "Foveal Projection During Ductions." Discussion by: Dr. Langdon, Dr. Feldman, Dr. Cowan, Dr. Brav and Dr. Peckham.

Dr. Jacob Feldman (by invitation): "An Instrument for the Calibration of the Light Sense and Dark Adaptation." Discussion by: Dr. Spaeth, Dr. Langdon and Dr. Cowan.

April 19

Dr. Jensen (by invitation): "Drusen of the Nerve Head." Exhibition of Case. Discussion by: Dr. Zentmayer.

Dr. L. F. Appleman: "Asteroid Bodies in the Aqueous." Exhibition of Case. Discussion by: Dr. Zentmayer.

Dr. Luther C. Peter: "Blood Staining of the Cornea Following Trauma." Exhibition of Case. Discussion by: Dr. de-Schweinitz and Dr. Cowan.

Dr. Frederick A. Bothe and Dr. H. Maxwell Langdon: "A Bilateral Exophthalmos." Discussion by: Dr. Bothe and Dr. Dorrance.

Dr. H. Maxwell Langdon: "Gonorrheal Conjunctivitis Treated with Pregl's Solution." Discussion by: Dr. Cowan.

Dr. Wm. Zentmayer: "A Case of Retinal Blastoma Treated by Interstitial Use of Radon." A Preliminary Report. Discussion by: Dr. Fry, Dr. Fewell, Dr. Holloway and Dr. Zentmayer.

Dr. Wm. Thornwall Davis (by invitation): "Juvenile Macular Exudative Retinitis (Junius)." Report of a Case. Discussion by: Dr. Adler and Dr. Holloway.

Dr. Perce DeLong: "Laboratory Studies in Focal Infections." Discussion by: Dr. McAndrews.

Hazel A. Wentworth, Ph.D (by invitation): "The Tangentometer: A Portable Instrument for Charting Tangent Screens at Various Distances." Discussion by: Dr. Holloway.

PROCEEDINGS OF THE SECTION ON OTOLOGY AND LARYNGOLOGY, JANUARY TO MAY, 1934

January 17

Demonstration of Injection of Gelatin into the Peritonsillar Spaces. By Dr. Geo. B. Wood.

In infants infection seems to penetrate the posterior pharyngeal wall and enter the pharyngo-maxillary space. In adults this does not occur. An areolar space was demonstrated back of the tonsil and definite facial planes were shown which prevented the spreading of the injection material antero-posteriorly. The material could freely spread supero-inferiorly.

Discussion: *Dr. Oscar V. Batson:* It always worried me, where peritonsillar abscesses might be. In a recent correspondence from Dr. Le May of Paris, who was here recently he said that French physicians were working on this problem and corroborate Dr. Wood's findings.

Dr. Wood: Any infection outside of the superior constrictor muscle may become a phlegmon, but inside of this, it is not apt to occur.

Congenital Deformities of the Face. Types Found in a Series of One Thousand Cases. By Dr. Warren B. Davis.

In this review of one thousand cases, the varieties of the malformations were classified, the relative frequency of each type noted, and brief embryologic considerations given.

The principle deformities were: unilateral cleft lip 112, unilateral cleft lip and alveolar process 74, unilateral cleft lip and cleft-palate 334, bilateral cleft lip and cleft-palate 115, cleft involving only soft palate 51, cleft extending to mid-portion of palate 46, cleft of palate to premaxilla 143.

In most cases, the congenital deformities resulted from the failure of union between the processes which enter into the formation of the face. In other instances union had occurred, but some of the facial processes were malposed or maldeveloped. In occasional cases an embryologic explanation was difficult or impossible. In such cases the malformations may have resulted from the germ cells, or amniotic conditions.

Whatever the underlying etiologic factors may be, they have marked hereditary tendencies. In this series, the cases with lip or palate, or lip and palate clefts gave positive family histories of such hereditary tendencies in over 54 per cent of cases. In numerous cases blood Wassermann tests were made on the parents and on the patients, but syphilis was not found to be an etiologic factor in the cleft deformities.

Malformations attributed by parents, to maternal impressions have in no case been worthy of scientific consideration, since in every instance the alleged impression occurred later than the tenth week of embryonic life.

Race does have an important bearing. Clefts are rare in the negro, and less frequent in Hebrews than in other divisions of the white race.

Discussion: *Dr. A. L. Wright:* Brophy believed that clefts occurred in embryonic tissue. I would hardly believe this if I had not seen one of identical twins who had palate clefts. One placenta existed in this case.

Dr. J. A. Babbitt: Was observation made in regard to cleft palate predisposing to middle ear trouble? Might not this series be favorable for establishing Whitmachs theory of the sclerotic mastoid?

Dr. Davis: Answering Dr. Wright, Brophy's idea in explaining clefts is not now held except by Dr. Sherer of Omaha. In regard to Dr. Babbitt's discussion, cleft palate cases are decidedly more subject to ear abscesses than other patients.

Why Otolaryngologists Frequently Fail to Remove a Focus of Infection. By Dr. Myer Solis-Cohen.

The impression that the otolaryngologist can remove a focus of infection is based upon the common misconception which concentrates attention on infected tissue rather than the infecting bacteria. The infecting organisms still remain in the adjacent tissue, continuing to multiply and elaborating toxins. Recovery occurs only when the infecting germs and their toxic products have been overcome by the patient's defensive forces.

The mere presence or even predominance of a micro-organism in an infected tissue or secretion is no indication of an etiologic relationship. The chief objection, therefore, to ordinary autogenous vaccine in subacute and chronic infection is that it frequently fails to contain the infecting germ, it seldom contains its soluble toxins, and it often has but feeble antigenic power.

The pathogen-selective culture, furnishes a means for selecting the etiologically important organisms from a mixed culture. The pathogen-selective vaccine consists of a broth culture of these germs and contains the soluble exotoxins as well as the endotoxins elaborated during their growth. Owing to its extremely high potency this vaccine must be administered with the greatest caution. The dose may have to be as low as one ten-billionth of a c.c. of a suspension consisting of one billion organisms in a c.c.

Discussion: *Dr. H. P. Schenk:* I agree with most of what Dr. Cohen has said, but have some difference of opinion as to stock vaccine, particularly in the treatment of the common cold. I believe, that vaccine made in the Chicago area may not be useful in the Philadelphia area. We probably often deal with secondary invaders which may change with successive colds. I think Dr. Cohen is right about exotoxin, intradermal tests are useful, not for finding a focus but to determine the allergen.

Dr. Philip Stout: Hypersensitiveness is a condition we must all take into consideration. Even mold floats in the air and may give rise to some of these conditions. Stock vaccine which is given while fresh gives better results and I think it should be used in the first two weeks after it has been made.

Dr. Karl M. Houser: I am impressed by the high dilution used by Dr. Cohen, and would like to ask in what type of patients these very high dilutions are necessary. Are the patients allergic or not? Is there any difference in reaction to the boullion with or without bacteria?

Dr. Solis-Cohen: I was particular to exclude acute infections and prophylaxis in this paper. What is often called a common cold, may be an exacerbation of a latent infection and it is necessary for recovery to get rid of the bacteria in such a case. I believe I have shown that toxin of any organism shows skin reactions which differ from those due to the organisms affecting the patient.

Congenital Multiple Hemorrhagic Telangiectasia with Epistaxis. By Dr. Karl M. Houser.

Since Rendu in 1896 and Osler in 1901, called attention to the association of multiple telangiectases with familial epistaxis, the condition is sometimes called Rendu-Osler's Disease. The latest comprehensive review of the subject by Hurst and Plummer in January, 1932, reporting the literature up to that time included fifty-seven family trees, showing indisputable evidence of the disease.

The family tree here reported illustrates the condition rather typically. A history of severe epistaxis runs through four generations. The author treated four patients in this group.

Males and females may both be affected and transmit the disease. In hemophilia, females are rarely if ever affected, yet almost always are the transmitters. The blood changes in multiple hemorrhagic telangiectasia are none other than those dependant upon the degree of secondary anaemia. There is no tendency to bleed readily from cuts, the hemorrhage always occurring from one or more of the telangiectases which must be present to allow the case to be properly classified as in this group.

The telangiectatic lesions are usually small red or purple spots, on the nasal mucosa of both septum and turbinates, and sometimes on the oral mucosa. The external distribution may vary and many, few, or none may be found. They may be distinguished from purpura by disappearing on pressure.

Microscopic examination of these naevi shows extreme thinness of the vessel walls. A single layer of endothelial cells is covered by a greatly thinned epithelium.

Death from epistaxis is relatively rare, the mortality being approximately four per cent. Death occurs from conditions induced by the recurring hemorrhage.

In three of the author's cases, cauterization of the lesions with chromic acid was rather effectual. In one case, no matter how thoroughly the lesions were destroyed, new ones formed in the adjacent mucosa in a relatively short time. The new naevi showed just as much tendency to bleed as the old ones.

Fitz-Hugh calls attention to the increasing intolerance to blood transfusions in this disease.

Discussion: *Dr. Robert Hunter:* I cannot make any contribution as to the frequency when new lesions appear. Goldstein wrote of this and called attention to the susceptibility of patients of middle age. I have seen three cases. Localization of lesions were in the throat, lip and chest; the bleeding was always from areas on the nasal septum.

Dr. Houser: I would like to know what results will be shown by Dr. Hunter's case, which is being treated by radium. One of the cases I reported had this form of treatment.

February 21

Presentation of a Case to Illustrate a Method of Plastic Flap Closure of a Fistulous Mastoid Wound. By Dr. Jas. A. Babbitt.

The case shown was one of two on which this method was used. The patient, 23 years old, when first seen, had a depressed left

mastoid wound and a fistulous tract through which the Eustachian tube was curetted. He had had a seventh nerve palsy on that side and had been deaf in that ear since mastoidectemy at one year of age. Under avertin and ether anaesthesia, the Almour plastic procedure was adopted in which a pedicled flap, consisting of skin, temporal muscle and periosteum, was inverted into the mastoid wound. Scar tissue was previously removed, the mastoid wound edges were undermined and the fibrosed posterior auricular wall was removed to make a complete radical drainage. A drainage tube was inserted through the auricular opening into the mastoid cavity and the wound was sutured. The patient made a good recovery with slight scarring and practically no depression. Since operation he has, moreover, been regaining power in his left cheek and improvement in hearing.

Discussion: *Dr. Geo. M. Coates:* I would like to ask Dr. Babbitt if he cleaned up the mastoid in the course of his operation.

Dr. Babbitt: The mastoid cavity was cleaned up and adhesions removed and the edges of the wound undermined.

Dr. Philip Stout: I think recovery of the facial nerve was due to the cleaning up about the severed part of the nerve.

Dr. Babbitt: The purpose of this presentation was to show complete filling in of a depressed mastoid wound following this method of muscle flap closure. The question of restored innervation is entirely a side issue.

Dr. Warren Davis: Revitalization of the facial nerve in this case may have been brought about by introducing the strip of temporal muscle into the wound.

The Incidence and Significance of Sinusitis in Pneumonia.

By Dr. Edward H. Campbell.

In this contribution, are presented observations on the association of sinusitis and pneumonia, and a study of the condition of the sinuses in 130 patients. The patients represent a consecutive unselected group varying in age from 3 weeks to 90 years. Acute sinusitis was found in 100 per cent. The diagnosis of sinusitis was made in practically all of these cases by the use of the nasopharyngoscope. In a few instances where pus could not be seen in the nose, but where sinusitis was suspected from the intranasal appearance, roentgenograms verified the suspicion. A 2 per cent solution of cocaine hydrochloride was used in the nose preliminary to the examination.

At times it was necessary to remove purulent or mucous secretion from the nose before a satisfactory view could be obtained. When pus was observed in the middle meatus it was concluded that it was coming from the anterior ethmoidal cells, the maxillary sinus, or both. When the pus was seen in the spheno-ethmoidal recess it indicated infection in the posterior ethmoidal cells, chiefly, but also at times infection of the sphenoid, especially in older children.

Statistics showed that in 45.4 per cent of the cases there was probable involvement of all the sinuses; in 23.8 per cent, probable involvement of the ethmoids alone, and in 5.4 per cent, probable involvement of all the sinuses of one side. Further study of the records showed that those cases having involvement of all the sinuses were usually among the youngest children. Records of 8 patients indicated pus discharging from the sinuses at a time when the lungs were entirely normal. Within a few days these patients developed pneumonia.

Discussion: *Dr. Warren B. Davis, Dr. S. R. Skillern, Dr. Geo. M. Coates, Dr. R. Parrish, Dr. Philip Stout.*

Primary Jugular Bulb Thrombosis in the Adult. By Dr. Henry Dintenfass.

Primary jugular bulb thrombosis in infants and children is not an infrequent occurrence, but in adults is extremely rare. Fraser's case, a 41 year old female, and the case herewith presented are the only examples in the writer's knowledge among the middle aged.

A white, male, aged 46 years, developed a spontaneous rupture of the left drumhead with muco-serous discharge. He complained of excruciatingly painful earache and left-sided headache. The temperature was 98.2° F. There was no sagging of the posterior-superior wall of the canal and no mastoid tenderness. Blood examination revealed 15,000 leukocytes with a polymorphonuclear percentage of 80. The x-ray showed only slight clouding of the mastoid cells. On the second day after admission to the hospital, January 7th, a chill developed and temperature rose to 105° F.

At operation removal of the mastoid cortex disclosed slight congestion of the mastoid cells but otherwise no pathologic changes. The lateral sinus was uncovered and the sinus wall was normal in all respects. Culture from the mastoid showed no

growth. On January 19th, the patient developed a second chill with temperature rising to 105° F. On January 22d, a slight swelling over the shoulder bursa developed. This was incised and revealed a greenish fluid which was sterile on culture. On January 23d, the mastoid wound was reopened. Despite the normal appearance of the sinus wall, the lateral sinus was incised. A profuse welling up of pus and thrombi appeared from the direction of the jugular bulb. Culture of the pus from the sinus showed hemolytic streptococci. Following jugular ligation there was definite improvement but temperature again rose to 105° F. Withdrawal of the gauze strip from the lumen of the sinus indicated that it had dammed back the pus. After this there was no further rise in temperature. The patient still complained of a left-sided headache, but after spinal puncture and withdrawal of several c.c. of fluid the headache lessened considerably and the patient was discharged from the hospital completely recovered.

Discussion: *Dr. S. Dana Weeder, Dr. Geo. B. Wood, Dr. David Husik and Dr. Philip Stout.*

Mucocele of the Right Frontal Sinus. By Dr. Robert J. Hunter.

A negro aged 53 years, showed a large hemispherical, painless swelling in the forehead above the right eye. The disease had begun fourteen months before with intense pain above the right eye. There was no vomiting or disturbance of vision. Twelve months before the onset of pain he had been hit above the right eye with a stevedore's hook.

The mass gave the impression of a rather tense cyst. There was no tenderness on palpation, no fluctuation and no inflammatory signs. It did not transmit light, was not nodular, but was regular in outline like a slowly growing sac. The patient showed no neurological signs. The eyegrounds were negative.

At operation a large quantity of thick opalescent fluid was evacuated, which was sterile and contained mucin. A large frontal sinus was found with the entire frontal plate eroded except a small margin. In the posterior wall of the sinus were two circular eroded areas, where the dura was exposed. No definite nasofrontal duct could be found. The mucous membrane of the sinus was very thin and did not look diseased.

Extensive bone absorption with inflammatory deposit of calcium salts make the diagnosis of mucocele by x-ray very difficult.

Discussion: *Dr. Ostrum* demonstrated the x-ray pictures of the case.

Dr. Husik: I inherited this case in the change of services. Since contact with this case I understand that mucoceles are quite unusual conditions and that they may attain quite large size. Needle puncture can often differentiate them from other growths.

Dr. Ralph Butler: I had a case many years ago of a young fellow who was kicked in the face. As was the treatment then, a gold tube was inserted. He did not continue treatment and died some years later of meningitis.

Dr. Hunter: Since this was my first case of this condition I did not realize it was so rare until I had looked it up in the literature. Among Dr. Pfahler's 12,000 slides there was not one of mucocele. In the collection of the Graduate Hospital I found one case of mucocele of the maxillary sinus, which is still rarer. Dr. Pancoast says he has no record of a case.

An Aural Problem. By Dr. Walter Roberts.

With respect to no class of cases has the feeling of uncertainty been more evident than in regard to some of our suppurating ears, which suddenly or periodically present high septic temperatures. Every aurist immediately has a mental picture of an infected lateral sinus and we have all been taught that the sooner we interfere operatively and relieve this condition, the better is the patient's chance of recovery. For the purpose of presenting another side of the picture and showing how easily we may be misled, the following is offered.

A child, four or five years old, was suffering from an acute attack of bilateral aural suppuration. Suddenly, without any apparent reason, she began to run a high septic temperature. She had no severe chills, although she did complain of chilly feelings.

Dr. B. A. Randall gave his opinion that the lateral sinuses were not as yet involved, that the usual local symptoms were lacking and that the septic temperature might be due to some other condition. He advised a course of calomel, followed by magnesium citrate two hours later and by one ounce of a 5 per cent solution of sodium bicarbonate by rectum at bed-time. The result of this treatment was a revelation. The temperature never went up again and the child returned to her home within a week. Evi-

dently the hyperpyrexia was due to acidosis. Many times since then the same success has been achieved in children. Not to be misunderstood, however, if the sinuses are really involved, treatment to combat acidosis will not benefit them; but on the other hand, it will do no harm.

To illustrate difficulties in correct diagnosis and how unnecessary operations on children with alarming symptoms may be avoided, three cases were reviewed.

Discussion: *Dr. Geo. M. Coates:* It is a great pleasure to hear Dr. Roberts read a paper again and I recall once after a staff meeting telling him of a difficult case on which I had operated. The temperature was "steeple chase" and there was the question of lateral sinus infection. Dr. Roberts advised calomel and soda and I had the satisfaction of seeing this case and a number of others like it clear up entirely, without operative interference.

Dr. Karl M. Houser: I remember a case which was about to be operated on, but x-ray of the chest was reported positive for pneumonia and so the condition was explained.

Dr. Roberts: The late Dr. S. Macuen Smith said in the last year of his life: "If you can wait until a barrier is formed around the infection the result is better. Be sure you are right, as nearly as you can, then go ahead."

March 21

Presentation of a Case of Chlorine Gas Poisoning. By Dr. Philip Stout.

This poisoning was due to inhaling the gas from a bottle which was jokingly poked into the patients mouth. Burns resulted on the inside of the right cheek, right anterior and posterior faucial pillars, soft palate, posterior pharyngeal wall, larynx, trachea, and bronchi. The patient felt sick, giddy and weak at once and soon developed headache. Some hours later he had a great deal of pain in his throat interfering with sleep and swallowing. Recovery occurred with some impairment in general health and strength and with partial aphonia.

The Sphenoid Sinus. By Dr. Robert F. Ridpath.

Until the third year the sphenoid sinus is nasal in position, while in the adult it is in the body of the sphenoid bone and occupies almost a central position in the skull. Pneumatization

is exceedingly variable, frequently extending into the pterygoid processes, the lesser wings of the bone and the anterior clinoid processes. Seldom do we see complete non-development of the sphenoid sinus.

The ostium situated in the upper third of the anterior wall is visible only when near the median line and with a normal spheno-ethmoidal fissure visualization of the opening is impossible. Closely associated with the superior wall we have the right and left optic nerves and the optic chiasm. Above and slightly posterior are the coronary sinuses and pituitary body in the sella turcica. Within the mucous membrane covering the anterior-inferior wall is the pharyngo-palatine artery, which when cut causes a frightful hemorrhage. The external wall helps to form a portion of the middle cerebral fossa and is in apposition with the cavernous sinus and internal carotid artery. Numerous perforations are present for the passage of small venous capillaries which anastomose with the cavernous sinus.

When diseased, the sphenoid sinus gives rise to a complexity of symptoms. Those associated with acute infection are pain, inability to concentrate, aversion to mental or any work, cough, malaise, anorexia and vertigo. Objectively there is discharge, cacosmia, crusts or pus on the pharyngeal wall, swollen tissue in the spheno-ethmoidal fissure, and more or less proptosis of the eye. The ocular symptoms may be an enlargement of the blind spot and scotoma.

The diagnosis of sphenoidal disease cannot always be made by the usual routine examination. When a condition is present which might be caused by sphenoidal infection, it is justifiable to pause and examine this sinus carefully even in an otherwise normal nose. No other sinus presents such a wide deviation in the subjective, objective and toxic symptoms as the chronically diseased sphenoid. I have divided these various symptoms into several groups.

First, the objective: Should a secretion be present it is either seen coming direct from the ostium or as a tenacious discharge of a dark yellow or greenish color clinging on the pharyngeal wall. This discharge quickly changes into scale or scab formation and may by capillary attraction invade the olfactory fissure as well as the choana. The typical cacosmic odor is perceptible on the breath as well as from the nasal chambers. Enlargement of the

blind spot is also a condition to be looked for. Paralysis of the external ocular muscles or muscle may occur.

The subjective symptoms may be divided into: pressure symptoms, mental symptoms, ocular symptoms, toxic symptoms, olfactory symptoms, general systemic disturbances, and complications, such as: thrombosis of the cavernous sinus, retrobulbar neuritis and basilar meningitis.

Discussion: *Dr. Samuel R. Skillern, Jr., and Dr. Oscar V. Batson.*

Tuberculosis of the Larynx. By Dr. Robert M. Lukens.

The larynx is subject to upper respiratory infection and trauma due to cough and vocal abuse.

Laryngeal lesions do not follow the course of the pulmonary lesion necessarily. A tuberculous larynx may improve under proper treatment, while the pulmonary lesion becomes worse. Consequently, a tuberculous patient should be under the care of both the internist and laryngologist at all times.

Routine nose and throat examination of patients with tuberculosis reveals that the vast majority suffer from nasal and pharyngeal infection and many from advanced sinus disease. In any case of tuberculosis of the larynx in which there is the least suspicion of cancer, a biopsy should be done. Cautery is accepted as a curative treatment for laryngeal tuberculosis. However, in the hands of the inexperienced, cautery can be very dangerous. In doubtful cases it is well to make only one application of the cautery and watch the reaction of the tissues as a guide. Frequent gentle treatment is far better than vigorous extensive treatment at longer intervals.

The only indications for tracheotomy are uncontrollable vocal abuse and as an emergency.

To be effective chaulmoogra oil must be the true chaulmoogra oil, an organic oil and as such is absorbed by the tissues. If used carelessly or unskillfully some of it may be swallowed and produce gastritis. It has no effect upon pyogenic infections of the larynx, but acts as a bactericide for acid-fast bacilli.

In advanced and extensive involvement of the larynx, injection of alcohol around the superior laryngeal nerve relieves painful swallowing for from twenty-four hours to eighty days.

Discussion: *Dr. Louis H. Clerf:* I enjoyed Dr. Lukens paper very much and envy him his results in treating tuberculosis of the larynx. I would like to emphasize the importance of doing biopsies on the larynx.

Dr. James A. Babbitt: I want to commend a man who has been so honest about his methods and willing to cast aside many of the former procedures, which were found wanting. I would like to ask Dr. Lukens what are the indications for the use of mono-p-chloro-phenol.

Dr. Gabriel Tucker: I too, have enjoyed Dr. Lukens presentation and like Dr. Clerf, am interested in his remarks about biopsies. I also have not seen any ill effects from this procedure.

Dr. E. J. Donnelly: In some cases cautery produces severe reaction. I would like to ask Dr. Lukens what he considers are the indications for its use.

Dr. Lukens: Answering Dr. Babbitt's question, mono-p-chloro-phenol, is used mainly in subacute, chronic or irritated conditions of the larynx. Regarding cautery, there is only one reason for its use; that is, to reduce greatly swollen and edematous arytenoids. It makes no difference whether the patient has fever or not, but rather whether the larynx looks as if it would stand cautery puncture well.

The Pedicle of the Tonsil. (Chalk Talk and Demonstration with wet specimen.) By Dr. Oscar V. Batson.

Coursing postero-laterally from the tonsil and oro-pharynx, into the deep tissues of the neck there is on either side a pedicle-like structure which separates the retropharyngeal space from the pharyngomaxillary space of the same side. This pedicle contains the styloid muscle, the carotid arteries, the internal jugular vein and the associated dense connective tissues. These make a firm, dense mass, the intricate anatomy of which need not be disturbed in the surgical drainage of suppurative collections in the retropharyngeal or pharyngomaxillary spaces. Either space may be entered by a skin fascia incision at the places where the spaces approach nearest to the surface.

An incision parallel to, and in front of, the sterno-mastoid muscle at the level of the angle of the jaw allows blunt dissection forward and upward along the internal pterygoid muscle. This exposes the entire pharyngomaxillary space and, since the pedicle lies behind, the procedure is practically bloodless.

An incision parallel to and behind the sterno-mastoid muscle, in the lower half of the neck, permits a blunt dissection to be carried into the retropharyngeal space behind the great vessels and the neck viscera, for here the pedicle lies in front. It is possible here, in what amounts to a bloodless manner, to ascend in this

retropharyngeal space to the base of the skull or to descend into the mediastinum.

As demonstrated in the anatomical specimen, with one index finger through the upper incision and the other index finger carried upward through the lower incision, the pedicle of the oropharynx and tonsil terminating in the tonsil, lies between the fingers.

Discussion: *Dr. Benjamin Shuster:* From the clinicians standpoint, many of the questions brought out by Dr. Batson are not of practical importance. The injection of the peritonsillar space from the neck for a tonsil operation would seem unnecessarily dangerous, and the practical approach to a pharyngeal abscess would seem to be through the mouth. From the standpoint of locating the spread of infection this demonstration is important and interesting. On the other hand it is not so simple to manipulate the tissues in the living as in the specimen. Dr. Batson's incision at the angle of the jaw, has the real danger of injury to the facial nerve. The incision of Dr. Mosier to reach the tissues beneath the floor of the mouth is simpler and without danger.

Dr. Robert M. Wolff: I would like to ask Dr. Batson whether we might open a pharyngeal abscess through his incision.

Dr. Samuel R. Skillern, Jr.: I recall four or five cases in which there was brawny swelling in what I think is the prevertebral space, from maxillary sinus disease.

Dr. Batson: I would like to thank Dr. Shuster for his balance-wheel discussion. On account of adherence, at the median raphe, of the fibrous tunics, peritonsillar or pharyngeal abscesses will not pass the middle line, but once in the retropharyngeal space an abscess will spread to both sides. The point concerning danger to the facial nerve is well taken and incision must be low enough to avoid this danger. As to Dr. Skillern's observation, I think this swelling is due to lymphatic drainage to the prevertebral region.

April 18

The Influence of Allergy on Rhinology. By Dr. Wm. V. Mullin.

Allergy is a subject that should receive increasing attention from rhinologists. The failure to recognize and evaluate the importance of allergy in many cases seems one of the outstanding causes for the failure of nasal and sinus operations.

The difference between hyperplastic tissue and the true mucous polyp is minimal, and the question as to whether the infection precedes, is secondary to or concomitant with the allergic disturbance is difficult to answer. The fact that bacteria are ob-

tained in surface cultures, sinus washings, or even in the tissues, does not disprove the prime importance of the allergic factor. An attack on the infection will not relieve the nasal edema nor prevent recurrence of the mucous polyp, but complete desensitization in early cases will rid the patient of both the edema and the infection. Furthermore, autogenous vaccines prepared from nasal cultures may produce neither local nor general reactions, and yet all the infection may be eliminated with eradication of the offending allergens.

The success of the results is in direct proportion to the thoroughness of the study and the time devoted to explaining the problem to the patient. Cooperation from the patient is seldom obtained at first, and usually lack of progress and relapses are necessary to convince him that half-way measures are futile. There is a decided advantage in giving the patient written instructions.

After a complete history has been obtained, the patient should be tested with all possibly offending substances. A reexamination in sixteen to twenty-four hours is made to detect delayed reactions. Some of our best therapeutic results have followed the elimination of allergens in patients who exhibited questionable reactions to the tests.

The child with allergic disease has marked demineralization of the bones. The administration of cod liver oil, viosterol, calcium, potassium or phosphates has no effect until the allergic condition is under control.

Most hypersensitive noses in allergic patients are made worse by local treatment. As for surgical treatment in this type of case, we have ample proof that operation on the nose or sinus without correction of the allergic disturbance, will not relieve the symptoms and that it will only serve to make the patient more miserable. Six cases were briefly reported.

Underlying Principles of Allergy. By Dr. John Kolmer.

Five to ten per cent of human beings present clinical manifestations of allergy, while a larger number give positive skin reactions without clinical manifestations (potential allergy).

The exciting agent is generally designated as allergen, atopen or anaphylactogen. The list of known allergens is bewilderingly large and is growing every year.

An antibody to the exciting agent or allergen is necessary for the production of allergy. It is called allergin, reagin or anaphylactin. The amount of antibody present in the blood is proportional to the degree of skin reactions but not to severity of symptoms.

The most commonly accepted theory of the mechanism of allergy is the "cellular theory." The exciting agent or allergen engenders antibody. The antibody occurs principally in or upon cells; subsequently when allergen gains access it unites with antibody. The result is allergic shock of the cell, producing or liberating a histamine-like substance responsible for the lesions and symptoms. The union of free or circulating antibody in the blood with allergen is believed to be without harmful effects and may prevent shock of cells.

Heredity exerts a very important influence upon allergy. The nature of this is not known, apparently a dominant Mendelian character, probably an exaggerated capacity of body cells for acquiring sensitization along with an unstable or hyper-excitable vasomotor system. There is a tendency to specificity in the hereditary factor.

Desensitization means the removal of antibody from sensitized cells. This is usually accomplished by the gradual administration of an extract of allergen and forms the basis of specific therapy. Partial desensitization may be sometimes accomplished by the administration of unrelated substances like peptone, sodium chloride, etc.

Adrenalin chloride and to a lesser extent ephedrine are physiological antidotes for allergic reactions.

Discussion: *Dr. J. Alexander Clark:* No allergist would object to anything in either of these papers. Dr. Cook believes there is such a condition as bacterial allergy. The effect of bacteria is allergic and their products should be considered as allergens.

Frequently the otolaryngologist will tell his patient that the allergist will cure his allergic condition. This is not correct. We hyposensitize the patient, but correctly speaking do not desensitize him. The whole condition is based upon heredity and you can not change this any more than the color of the hair. It is possible, however, to reduce sensitivity.

Estimation of the eosinophils is important in these conditions, but in about one-third of the cases does not show any correlation.

The allergic patient is peculiar also in regard to blood pressure. This is usually low, but if it be raised this does not seem to benefit him. Pregnancy may either improve the condition or may make it worse.

The results of bacterin treatment of allergy are sometimes startling. This is especially true of nasal allergy. Among the patients with blocked noses about one-third give no skin reactions. We have to depend on vaccine in these cases. We usually start with 1/10 c.c. dose.

Dr. Mullin mentioned the elimination of the allergen in these patients, but this is often the hardest thing to accomplish. He seems to hold a red flag in front of us in advising that the allergist always be consulted and that not much local treatment be given.

Dr. Richard A. Kern: If Dr. Mullin and Dr. Kolmer left anything unsaid, Dr. Clark said it.

Dr. Kolmer has painted a picture of what we have learned in the past twenty odd years. To emphasize: 5 to 10 per cent of all of us have at some time in our lives some hypersensitiveness. The mode of expression varies. Look at the formidable list of sensitives. The pendulum is swinging toward allergy and clinicians are beginning to blame all kinds of conditions on allergy. We are becoming conscious that various disease processes are colored by these allergic factors.

The allergic child should not overeat of one form of food. Nasal surgery or even tonsillectomy should not be performed on such subjects in the pollen season. Otherwise, some subsensitive threshold may be brought to the surface and the individual show some new sensitivity.

A complete diagnosis is essential and an effort should be made to find all the substances to which the patient is susceptible. It is axiomatic that avoidance of substances to which the patient is sensitive is the best treatment.

Dr. Geo. M. Coates: I have nothing really to add to the subject, but I want to express real appreciation to Dr. Mullin and Dr. Kolmer for their excellent papers. We are very often at sea in determining the underlying factor for allergic symptoms. In this connection Dr. Arthur Proetz astounded me, a number of years ago, by telling of a patient whose nose was full of polyps, yet when examined before operation the next day, showed disappearance of every one.

The newer conception of allergy and its relation to sinus disease is not making us surgical nihilists, but merely conservative in relation to the allergic patient.

Dr. Harry P. Schenck: I would like to ask Dr. Mullin to describe involvement of the salivary gland in allergy. I am glad he did not find eosinophils in nasal secretion regularly.

Dr. Mullin: I had hoped that some of you would criticise me, but feel that you are all being very generous. In regard to Dr. Coates who spoke of Dr. Proetz's findings, I am reminded that I have seen polyps disappear in this same way, in one case clearing up in the same afternoon. Answering Dr. Skillern in regard to one of his cases of asthma: maybe it was asthma, but very likely not allergic, perhaps bacterial. On one occasion I gave a patient saliphen and sent her aspirin later; this nearly killed her; she was evidently sensitive to salicylates. I have abandoned the term vasomotor rhinitis and think the condition is one of allergy, as it explains a larger group of these phenomena. One

patient of mine was held up and struck by a negro, the shock of which brought on allergic attacks. As to Dr. Clark's remarks in respect to Caldwell Luc and other radical sinus operations: I think if we see these cases early, many of them will clear up without operation, the mucous membrane taking on its function again; but should this not occur, operation is certainly necessary. Salivary gland allergy may affect one or all of the salivary glands. A certain woman gets it after taking creme de menthe; a certain doctor gets it after a particular kind of beer: I think this is an expression of allergy.

May 16

The Educated Voice from a Medical and Economic Point of View. By Dr. Charles P. Grayson.

What is meant by the educated voice is one notable for its purity of tone; with no suspicion of dryness; it flows smoothly, has no sudden changes of pitch or power; its quality shows there is no muscular interference. It uses to fullest advantage the resonance given to it by the several resonating cavities; it contains the complete series of overtones, and finally it is flexible. Such a seemingly ideal development of the human voice is possible.

The economic value of an even moderately well developed voice and its value as a bread-winning asset is little inferior in importance to that of good vision and hearing. Early instruction in the proper use of the voice would largely prevent the fatiguing strain to which the vocal cords and their muscles are so frequently exposed and the repeated hyperemias and congestions which lower their resistance and make them the victims of catarrhal inflammation.

What the connection between the reproductive system and the larynx may be, is by no means certain, but the maturing of the two is coincident. Within a few weeks, we find that the larynx as a whole has increased all its dimensions. It is during the period of re-adaption of the cords and muscles to their more roomy quarters, that every now and then their tension weakens for an instant and the voice breaks.

Children mimic their elders successfully in many ways, and, if born into a family environment of educated voices, they will adopt the vocal models surrounding them. From such families we do not draw our laryngeal patients. It is in the opposite type, which from dawn to darkness seem determined to out-shout each other, that we see the whole upper air-tract in a state of smoulder-

ing congestion or hyperemia, requiring very little to start an acute inflammation. Therefore, is it not one of our responsibilities to enlighten adults and children as to the cumulative risk that they run by the harmful straining of their voices?

Congenital Web of the Larynx. By Dr. Gabriel Tucker.

Congenital web of the larynx is extremely rare. The case here reported was twenty years of age and according to the mother's statement, had never been able to produce a clear vocal sound since birth. Examination showed that the web stenosis involved the middle third of the cords, appearing as a thin semi-transparent grayish membrane, almost triangular in shape. The anterior third of the cords appeared adherent. The margins of the cord could be distinguished parallel in the thick portion of the diaphragm-like structure. On either side the tissues seemed to be thinned out.

The treatment was incision of the thin portion and extension of the incision forward between the adherent margins of the cord. The thin portion of the web very quickly disappeared after incision and gentle dilatation. The thick fleshy portion required repeated incision and as dilatation produced trauma this was abandoned. At bi-weekly intervals the incision was repeated and local application made of compound tincture of benzoin until the cords were completely separated. Vocal exercises were given and the patient developed a very good speaking voice.

Discussion: *Dr. F. O. Lewis:* Recently I saw a patient with a web at the level of the third ring of the trachea, which was apparently congenital. Because of the symptoms the patient was being treated for asthma. The patient's condition was so alarming that tracheotomy was necessary. Following this, several pieces were removed with punch forceps and the patient made a satisfactory recovery.

Roentgenotherapy in Otorrhea Following Radical Mastoidectomy. By Dr. Matthew S. Ersner and Dr. Louis H. Weiner.

While we recognize that a cessation of aural discharge following a radical mastoidectomy is not an indication of success or failure, it is nevertheless considered so from the patient's point of view. It often becomes necessary to pursue a variety of procedures in order to obtain a dry ear. Roentgenotherapy has suc-

ceeded when other methods have failed. The technique was suggested by Dr. Barton R. Young of Temple University. A small area was used and the ray directed at the external auditory meatus, the dosage being: 160 Kv., 50 cm. target skin distance, 1.2 mm. Cu. and 1 mm. Al. filters, for 2½ minutes. The radi- An average of eight treatments has been required. The patient is immediately referred back to the otologist, who in turn again cleanses, dries and firmly repacks the aural canal with plain gauze. An average of eight treatments has been required. The patient is instructed to apply intermittent pressure in rapid succession, with the index finger over the tragus. Fifteen cases of persistent otorrhea have been successfully treated by this method.

The x-ray has a peculiar affinity for embryonic tissue and the dosage has been so well established that we can definitely destroy the embryonic granulation tissue without disturbing the epithelial ingrowth. Massaging the ear stimulates epidermization. The packing in the interim further prevents granulation tissue formation.

Discussion: *Dr. Matthew S. Ersner:* Several problems confront us in treating patients after radical mastoidectomy. We have called attention in the paper to our enemy the "connective tissue." In the cases where we have failed we have found a growth of granulation or connective tissue. Such cases need a covering, so we induce this by using a skin-flap or Tierch-flap. Nature seems to want an ectodermal protection.

Dr. George M. Coates: Dr. Ersner is right in assuming that nature's tendency to protect under-lying tissue is by epidermization. There is no doubt that we would do more radical mastoidectomies, if we could assure our patients of dry ears. I think this method as presented is encouraging. The presence of exuberant granulation tissue is evidently the cause of our failures.

PROCEEDINGS OF THE SECTION ON GENERAL MEDICINE, JANUARY TO MAY, 1934

January 24

(Combined Meeting with the Section on Medical History)

Thomas Addison and His Discovery of Idiopathic Anemia. By Esmond R. Long, M.D.

Addison's only extended description of pernicious anemia occurs in the introduction to his monograph "On the Constitutional and Local Effects of Disease of the Supra-Renal Capsules" (London 1855). In this publication he definitely dissociated 'idiopathic anemia' and disease of the suprarenals. He had previously associated the two conditions in presentations before London medical societies. Only one of these is on record, that before the South London Medical Society, March 15, 1849. He had become interested in 'idiopathic' anemia some years before, at least as early as 1843, and it was in search for its cause that he discovered Addison's disease. When Biermer's discovery was published Addison's had been forgotten, but his original descriptions were then brought to public attention by two of his pupils, Wilks and Pye-Smith. Both Addison and Biermer had been anticipated by J. S. Combe, however, who published a good account of the disease in 1822. Addison's lack of recognition in his own time was due in part to his forbidding character. Appreciation of his greatness was almost restricted to Guy's Hospital, where he was the outstanding figure.

Evolution of the Views Concerning the Bone Marrow Changes in Pernicious Anemia. By Harold W. Jones, M.D., and Leandro M. Tocantins, M.D.

The studies of Bizozzero and Neumanne on the histology of the bone marrow tended to point out that the embryonal predecessors of the red blood cell were present in this location. This was the first attempt to link up the circulating erythrocytes with their parent tissue, the bone marrow.

William Pepper, in 1875, after a study of the work of Neumanne and Bizozzero, concluded that it might be well to examine bone marrow in cases of pernicious anemia. He made studies of the bone marrow in an undoubted case of the disease and was the first to describe the bone marrow in this condition. He felt that the name pseudoleukemia, which had been applied to all conditions in which there was splenic and hepatic enlargement, plus anemia, was not suitable for pernicious anemia, and again directed attention to the importance of the changes in the bone marrow. Cohnheim's studies led to a similar conclusion.

Ehrlich, developing his staining methods for blood tissue, confirmed the belief of the men who had preceded him. Rindfleisch confirmed Ehrlich's work. Their views were in contradistinction to those held by Hunter and Muir, who felt the bone marrow changes were the result of blood destruction.

Warthin pointed out the increased phagocytosis in the bone marrow and blood forming organs. This was later emphasized by Peabody. Zadek, in 1922, demonstrated the change in the megaloblast during the active phase of the disease and during the remission. Peabody carried on this work and added much to our knowledge concerning the pathology of this disease.

Remarks Concerning the Discovery of Liver Feeding in Pernicious Anemia. By George Minot, M.D. (by invitation).

February 26

Histamine Iontophoresis in the Treatment of Vasospastic States. By Joseph C. Doane, M.D.

Histamine, a biogenic amine isolated by Barger in 1907, is produced from histidine by the loss of carbon dioxide. This change is brought about by the action of intestinal bacteria chiefly of the colon and typhoid group. This substance exerts a very marked effect on unstriped muscle. It produces contractions of the uterus, bronchial spasm, entero-spasm, peripheral capillary dilatation, localized edemas and tachycardia when administered in full doses. The histamine and urticarial wheals appear identical. Histamine has not been used hitherto in this country as a drug introduced by means of ionization by the galvanic current. The European observers, Deutsch, Trumpp, Villaret, Bettman and

others have employed this agent in the treatment of such conditions as sciatica, chronic polyarthritis, arthralgias, muscle strain, lumbago, Raynaud's disease, Buerger's disease and chronic ulcerations such as are seen on the extremities of those suffering from diabetes and arteriosclerosis. The author has endeavored to reproduce the findings of these clinicians. Case histories were presented to demonstrate the beneficial results of treatment in a male, age 59, suffering with Buerger's disease and marked painful spasm of the calf muscles. Proof was submitted of the persistent and lasting elevation of surface temperature of both lower extremities while immersed in a 1:10,000 solution of histamine hydrochloride and with the addition of a galvanic current of 10 milliamperes for ten minutes. After about twenty-four treatments the patient's inability to walk and the discomfort in his extremities were almost completely relieved. A case of Raynaud's disease was likewise reported in which marked improvement was noted and the elevation of the surface temperature was marked, in some instances to as much as 4.5 degrees centigrade. Another case of chronic ulceration of the foot in a diabetic was reported as having been much benefited. A preliminary report was made on the treatment of chronic hypertrophic arthritis, and spastic paraplegia. The author presents the opinion that the use of histamine by the ionization method offers a splendid method for producing hyperemia and that in his hands marked clinical improvement has been observed in spastic states involving vascular and muscular structures.

Beri-beri Following Drastic Voluntary Dietary Restriction. By David Riesman, M.D., Sc.D., and Harold S. Davidson, M.D. (by invitation).

After a brief historical summary, the authors reported the following cases:

Case I. E. W., is 76 years of age. At 23 he had "head stroke"; at that time he was given so many different kinds of medicine that ever since he has had stomach trouble. Gradually he eliminated one article of food after another. About a year and a half ago he became so ill that he excluded all foods, except milk. He became progressively weaker and last August (1933) his legs began to swell. The swelling grew more pronounced and

eventually involved face and hands. The greatly swollen legs were so painful that he screamed when they were touched. Eventually he became utterly helpless. It was at this time that one of us (D) first saw him and a week later R. The heart was enlarged to the right; hands, face and legs were edematous; the calf muscles extremely tender to touch. A diagnosis of beri-beri was made. Only the persuasion of both of us finally broke down the man's resistance against going to the hospital. Because of his unwillingness to cooperate, a Jutte tube was introduced into the stomach and through it large quantities of food administered, also large doses of iron and ammonium citrate. On the fourth day he removed the tube himself and said he would eat whatever was given to him, if he were permitted to go home. The swelling subsided within two weeks and the pain in the calves of the legs had almost entirely disappeared by that time. He had no more indigestion. He now walks out of doors unaided.

The second case is one that I (R) have not seen personally. It came to my attention through the fact that the patient's physician consulted me and laid the details before me, on the strength of which I made a diagnosis of beri-beri. The patient was a young lady much overweight who in an effort to reduce her avoirdupois had adopted a meager and monotonous diet. After a few weeks she became short of breath, had palpitation, and edema of the legs. It was thought she was suffering from heart disease, but she had no rheumatic history and prior to her voluntary dietary restriction had been in the best of health. To my mind there was in this patient no primary cardiac trouble; the symptoms were those of a deficiency disease, of beri-beri. Under a sensible dietetic regimen, and that alone, the young woman made a prompt recovery.

Endamoeba Histolytica: Its Incidence in 1060 Philadelphia Students; Its Morphological Characteristics. By John H. Arnett, M.D., D. H. Wenrich, Ph.D., and R. M. Stabler, Sc.D.

This study represents surveys made during the past three years upon Freshmen in a professional school in Philadelphia. It is based upon the examination of a single feces sample obtained without laxative or enema, the sample being subjected to several methods of examination: (*a*) admixed with physiological salt so-

lution, (*b*) with weak solution of iodine and (*c*) in preparations fixed and stained with hematoxylin.

It is now recognized that *Endamoeba histolytica* can be differentiated best from the other amoebae of the intestinal tract by examining the stained cysts rather than the motile forms. Hence the advantage of the formed stool over the liquid one, the former being more likely to contain cysts, the latter motile forms. *Endamoeba histolytica* because of its variable morphology may be confused not only with any of the various amoebae, but also with *Blastocystis* which is so commonly present in the intestinal tract.

In 1060 stool examinations *Endamoeba histolytica* was found in 4.1 per cent. its incidence being much the same in each year. A significant[1] difference was found between the incidence of the organism in the men and in the women of the group, it being more than twice as common in the men (4.9 per cent in 709 men as against 2.3 per cent in 351 women). Its incidence in 543 students residing in Philadelphia or within 15 miles of its center was 5.2 per cent, as compared with 3.4 per cent in 203 students residing in other sections of Pennsylvania. The incidence for the entire state was 4.7 per cent, that for New Jersey was 1.9 per cent in 206 students, a significant difference.[1]

In the entire group studied, the following organisms were found in the following order of frequency: *Blastocystis* (63.2 per cent), *Endamoeba coli* (14.5 per cent), *Endolimax nana* (11.4 per cent), *Giardia* (7.5 per cent), *Endamoeba histolytica* (4.1 per cent), *Dientamoeba* (4.3 per cent), *Iodamoeba* (1.0 per cent), *Chilomastix* (0.94 per cent). Of these, *Endamoeba histolytica* alone is generally recognized as pathogenic for man.

THE GENESIS OF ONE GROUP OF SECONDARY PNEUMONIAS. By V. H. Moon, M.D.

Pulmonary congestion and edema, not caused by cardiac deficiency, precede the development of a group of secondary pneumonias. Circulatory failure of the shock type produces marked pulmonary congestion and edema resulting from atony of capillaries and venules. Krogh showed that capillary atony and dilatation result from all types of capillary poisons. Severe toxemia

[1] Differences exceeding twice the standard error are regarded as significant.

of diverse origin causes such vascular atony and permeability to develop gradually. Severe burns, extensive surgical procedures, toxemias of pregnancy, pancreatitis, intestinal obstruction, mesenteric thrombosis, severe jaundice or infections of high virulence may cause circulatory deficiency of this type.

Secondary pneumonia following burns is typical of this group. The lungs are deep red, heavy, edematous and consolidated in irregularly distributed patches. Fibrin is deficient and the consolidation is less dense than in primary pneumonias. The results of bacteriologic studies are not uniform. Frequently mixed cultures result, including combinations of pneumococci, streptococci, staphylococci and *Micrococcus catarrhalis.*

The shock syndrome is prominent in fulminating cases of influenza. Hemo-concentration is marked and the postmortem findings in such cases are indistinguishable from those following burns. In cases of less severity secondary pneumonia is the terminal event. Toxemias of diverse origin may produce circulatory deficiency resulting in pulmonary congestion and edema. One group of secondary pneumonias results from infection of such lungs with the various pathogenic organisms present in the respiratory tract.

March 26

Aseptic Meningitis Following Diagnostic Lumbar Puncture: Indications for Lumbar Puncture and Complications Secondary thereto. By George Wilson, M.D., and Kenneth E. Reynolds, M.D.

Lumbar puncture is often followed by headache, neckache, and vertigo; less frequently by temporary meningitic signs, probably due to an outpouring of cells into the subarachnoid space. Lumbar puncture should not be done in the presence of a neoplasm of the posterior fossa or a brain abscess.

The work of Ayer and Felton suggests that meningitis is a possible complication of lumbar puncture in patients ill with acute infectious diseases such as pneumonia.

Lumbar puncture may cause a slight cerebral hemorrhage to rupture into the ventricles, but is indicated where syphilis is suspected as the cause of the cerebral accident.

Blood in the subarachnoid space, whether spontaneous or traumatic, should be removed by lumbar puncture. We have reported

a series of such cases where good results ensued from this treatment (McIver, Joseph and Wilson, George: "Spontaneous Subarachnoid Hemorrhage," J. A. M. A., 93: 89–93 (July 13), 1929).

Unfortunate sequellae of lumbar puncture may be avoided by (1) having the patient on his side, (2) using a small bored needle, (3) avoiding obvious cases of brain tumor and abscess, and (4) having the patient rest in bed twelve to twenty-four hours following the tap.

We have had three cases in which lumbar puncture was followed by signs of meningitis and increase of cells in the spinal fluid, but without discovery of organisms by smear and culture and without a reduction in the amount of sugar normally present. Spiller and Payne reported a case similar to these in 1924 after a puncture in a case of epilepsy. The diagnoses in our cases were cerebral syphilis, chronic encephalitis and a fibro-blastoma of the frontal region.

The term aseptic meningitis seems justified because no organisms were found by smear and culture and the spinal fluid sugar remained normal in the two cases tested. All these patients as also the one cited by Spiller and Payne recovered.

The manner in which the picture is produced is uncertain. Any foreign substance introduced into the spinal fluid may bring about an aseptic meningitis. Perhaps some particulate matter left in the needle after "cleaning" may have been the cause. Drainage of the spinal fluid for two or three successive days seemed curative in our patients.

THE CLINICAL USE OF SODIUM DINITROPHENOL 2–4. By Edward L. Bortz, M.D.

Sodium dinitrophenol 2–4 ($C_6H_3(NO_2)_2ONa$) is the crystalline sodium salt of dinitrophenol, a chemical compound which was used in the manufacture of explosives during the World War and caused symptoms of intoxication among the workers. On examination it was noted that the individuals affected all showed an elevation of temperature from 1 to 5° F. and moderate to marked loss of body weight. Pathological investigation of those that died revealed no characteristic lesion anywhere in the body except pulmonary edema and, in some cases, fatty infiltration of the liver.

Because of this specific effect, experimental physiologists be-

came interested in the compound as a possible accelerant of catabolism. It has been proven that this chemical can increase metabolism to a high level without causing damage to vital organs and functions, but when extremely large doses are taken, more heat is produced than the animal organism can dissipate.

The pharmacological action is a direct stimulation of cellular metabolism with burning of the *usual* energy materials and not at the expense of any one type of tissue, not dependent upon the type of diet nor on any humoral or nervous control. This increase in combustion results in a sensation of warmth, in profuse perspiration and in loss of body weight. A concomitant effect is a general increase in well-being and a brightening of the mind. As long as the accepted therapeutic dosage is not exceeded, toxic effects will be limited to such minor symptoms as urticaria, indigestion, nervousness, giddiness, etc.

Sodium dinitrophenol was administered to 35 obese patients in the Metabolic Clinic of The Lankenau Hospital and its effects studied. It is concluded that this drug is capable of causing a notable reduction of weight in individuals who find it difficult or impossible to lose weight by the usual established method. Its indiscriminate use, however, should be avoided.

Results Obtained with Pneumococcus Antibody Solution in 130 Cases of Lobar Pneumonia. By William P. Belk, M.D., and John S. Sharpe, M.D. (*Accepted for publication by the American Journal of the Medical Sciences.*)

The experiences of Connor and of Cecil with pneumococcus antibody solution showed a definite reduction in mortality in pneumococcic lobar pneumonia in adults. The results were comparable to those reported with Felton's serum in Types I and II. Type IV infections were definitely benefited also. The use of the solution was discontinued because of the frequent and severe reactions produced.

The present series from the Medical Service of the Bryn Mawr Hospital, consists of 130 treated cases and 52 controls, of all ages. In adults, those treated within 72 hours of onset and with adequate amounts of the solution had a mortality of 20 per cent. Those treated late, or with inadequate amounts had a mortality of 28 per cent. The mortality in the untreated was 38 per cent.

In children under 12 years definite benefit was evident. Type IV infections responded definitely.

The solution was given in doses of 50 to 100 c.c., intravenously to adults, three times a day, and in half these amounts to children. In many children the solution was given intramuscularly. In all these cases only five definite reactions occurred. These consisted of a chill and a rise in temperature up to 106° F. All were followed by a pseudocrisis and some amelioration of symptoms. None was harmful. The intramuscular injections gave no reactions and were easily absorbed. The small incidence of reactions in this series as compared with the series of Connor and Cecil is explained by an improvement in the method of making the antibody solution.

It was concluded (1) that pneumococcus antibody solution as now made is practically non-toxic, (2) that it is safe in allergic individuals, (3) that it is effective when given intramuscularly to children, (4) that it appears to influence favorably all types of pneumococcic pneumonia (type III possibly excepted), and (5) that given early and in large doses it may be expected to reduce the mortality by about 50 per cent.

An Evaluation of the Means of Prognosis in Pulmonary Tuberculosis. By Richard T. Ellison, M.D.

Experience, the handling of many cases in all stages of the disease, coupled with careful observation and prolonged follow up of patients after discharge are without doubt the foundation of all accurate prognosis. In the past decade or so other tests and methods of examination have been introduced into the practice of medicine that have a definite value in the prognosis in pulmonary tuberculosis, and it was an effort to determine which of these procedures gave the earliest and most reliable information on this question that lead to the study presented herewith.

The various factors studied were: clinical course, physical examination of the lungs, roentgen examination, the weight curve, and sedimentation rate, in which the technique of Westergren was used.

The differential count was recorded in absolute numbers rather than in per cent because the percentage of cells in different specimens are not comparable when the total leucocyte count varies.

It is also my feeling that the number of circulating lymphocytes and monocytes should be considered separately and not in their relation to each other. Normal values: 700 cells per c.m.m. as the upper limit of normal for monocytes, 2000 as lower limit for lymphocytes, 5000 as upper limit for total polymorphonuclears, and 700 as upper limit for immature polymorphonuclears.

Summary

1. A comparison was made, in seventy-five cases of pulmonary tuberculosis, of various means of prognosis. These included clinical data, physical examination of the lungs, a weight chart, the sedimentation rate of the blood, serial X-ray examination of the lungs and the differential count of the white blood cells.

2. The impressions gained from this comparison as to the relative value of the different methods used, is discussed. It was found that they all contributed something to the final prognosis but with the exception of the differential count, there were certain circumstances or conditions arising in regard to each one in which they were unable to furnish any information or in which they lead to a false sense of security.

3. The conception of the healing of tuberculosis as being dependent on two factors, the humoral factor, or the immuno-biological reaction, and the mechanical factor is discussed. It was pointed out that a favorable immuno-biological reaction is an absolute necessity for healing and that a consideration of the differential white count gives the truest picture of the state of this reaction.

4. Placed in the order of their value in the prognosis of pulmonary tuberculosis by far the most important is the differential white count, next the study of serial X-ray films and then physical examination of the lungs. These latter two are almost on a par in value. This group includes those examinations which deal only with tuberculosis and the interpretation of which is applicable only to that disease. The remaining tests are non-specific in character and may be influenced by intercurrent conditions which must be taken into consideration in their interpretation in terms of prognosis in tuberculosis. These in the order of their value are the sedimentation rate, clinical data and weight curve.

April 23

Arteriosclerosis and Methods for Its Quantitative Estimation. By H. C. Bazett, L. B. Laplace and J. C. Scott.

The distinction of arteriosclerosis into small and large vessel types on the basis of the presence or absence of a rise in diastolic pressure does not allow of any quantitative estimation of the changes. The data in the literature demonstrate that not only is there a loss of distensibility in the walls of the large vessels, but also a considerable enlargement in the diameter and volume contents of the larger vessels. These appear to be simple age changes commencing early and progressing throughout life. There may also be an increased length in the vessels leading to tortuosity, and more or less marked diminution in the lumen of the smaller vessels causing an increase in the effective peripheral resistance. The cardiac output per minute is usually diminished, at any rate in the simple senile form, as has been demonstrated by Starr and his co-workers. Analysis of the pathological data of Kani and of Suter demonstrates that the enlargement of the vessels is particularly evident in large and heavy subjects, and allows an approximate prediction of the vessel size in subjects of varying age and weight.

The pulse pressure is increased by the increase in the elasticity coefficient, but the increased size of the large vessels and a decrease in the ratio of the thickness of the wall to the diameter both diminish the magnitude of this increase. The changes in the large vessels would result, if acting alone, in a rise in systolic, fall in diastolic and no change in mean pressure. If the changes in the small vessels decrease the lumen of the vessels even to a small extent, they cause a considerable increase in the effective peripheral resistance and consequently give a raised mean pressure in proportion to the cardiac output. In those subjects with a raised diastolic pressure this ratio may be tripled, and the large changes it undergoes make it a useful measure of changes in small vessels.

The changes in the large vessels may be measured either by measuring the pulse wave velocity in several vessels, since the changes may not be uniform in different vessels, or by comparison of the pulse pressure with the stroke volume, if this be expressed as a percentage of the probable contents of the large vessels.

Data are given to show that there may be definite evidence of decreased distensibility of the larger vessels even in a subject with a blood pressure of 100/56. The measurements in the large vessels indicate the combined resultant effects of the changes in size and increase in the elasticity coefficient, and do not allow separate analysis of these factors.

Heart Disease in Patients with Uterine Myomata: A Clinical Study of Fifty Cases. By Ferdinand Fetter, M.D.

Fifty patients operated upon for uterine myomata were studied thoroughly from a cardiovascular point of view. Examination was made before operation, after operation, and, in most of the patients, again from five to six months after operation. Twenty-five patients, 50 per cent of the total, were found to have cardiovascular abnormalities of one kind or another. Anemia was not a factor in producing heart disease, as only one patient was anemic and she had a normal heart. In 5 of the patients the only abnormality found was the T-waves of lead I or II of the electrocardiogram. These changes were attributed to a change in the position of the heart as a result of the tumor. In 5 patients obvious etiologic factors other than uterine myomata, viz: rheumatic infection, lues, and glomerulo-nephritis were present. The remaining 15 patients were hypertensive. No relation between hypertension and uterine myomata in the patients under 40 years of age was found, as the incidence of hypertension in these patients was no higher than its general incidence in women of the same age and race. In the smaller group of patients over 40 years of age the incidence of hypertension was higher than its general incidence in women of the same age and race. However, because of the small number of these cases conclusions concerning the relationship of the two conditions at this age period could not be made. The final conclusion reached was that there was no such entity as the "myoma heart" in the sense of a type of heart disease caused by and occurring with uterine myomata alone.

Acute Gonococcal Peritonitis of the Right Upper Quadrant in Women. By Thomas Fitz-Hugh, Jr., M.D.

In 1930, Curtis called attention to the occurrence of adhesions of the separate violin-string type stretching between the anterior

surface of the liver and the anterior abdominal wall in patients operated upon for chronic gonorrheal salpingitis.

The following three cases recently encountered seem to represent instances of the hitherto undescribed acute and early manifestations of gonococcal peritonitis of the right upper quadrant.

Case 1 was personally diagnosed as suffering from acute hydrops of the gall bladder, but at operation was found to have a peculiar, slightly moist, granular peritonitis involving the anterior surface of the liver and the peritoneum of the anterior abdominal wall adjacent thereto. The gall bladder and other organs were normal. Smears next day from the drainage tube which was placed at operation in the sub-hepatic fossa showed typical gram-negative intracellular biscuit-shaped diplococci. Subsequently, a frank history of prior gonorrheal salpingitis was obtained from the patient.

Cases 2 and 3 presented symptoms similar to Case 1 and in both the gonococcus was recovered from the cervix or urethra subsequently. In one of them a friction rub was heard under the right costal border during the acute stage.

The clinical picture of these cases is as follows: at some indefinite time, possibly several years after a previous gonorrheal infection, symptoms of mild pelvic reactivation begin: slight leucorrhea, dysuria and low abdominal pain and slight irregular fever; within a week or two sudden severe upper abdominal pain occurs with distention and rigidity, quickly localizing in the right upper quadrant and simulating acute gall bladder disease; a right upper abdominal friction rub may be heard at this stage; there is little or no leucocytosis but a marked acceleration of sedimentation rate; clinical recovery is the rule.

The Heart in Thyroid Disease: Electrocardiographic and Orthodiagraphic Studies Before and After Thyroidectomy. By Edward Rose, Alexander Margolies (by invitation) and Francis C. Wood.

A brief summary of studies made upon 106 patients with hyperthyroidism and 29 with non-toxic goiter is presented. Electrocardiograms and orthodiagrams were made before operation, within 7 days after operation and at intervals of approximately 3, 7, and 12 months thereafter. Eighty-one patients with hyper

thyroidism and 28 with non-toxic goiter were included in the orthodiagraphic studies. Cardiac enlargement was found in about one-third of the patients with hyperthyroidism. Its incidence tended to increase somewhat with the duration of the disease. Cardiac decompensation was almost always accompanied by cardiac enlargement, but successful thyroidectomy was followed by a reduction in heart size. Non-toxic goiter was not associated with significant changes in heart size. Increased pulsation with or without prominence of the pulmonary artery occurred in over half the thyrotoxic group, but tended to disappear with surgical relief. Neither toxic nor non-toxic goiter caused any characteristic change in the shape or position of the heart.

The electrocardiograms of 106 patients were analyzed. Large P waves were common. They are usually reduced in size after successful operation. In hyperthyroidism the electrical axis of the heart shifts to the left following thyroidectomy in about half the cases. The cause of this is not apparent. Marked T wave changes occur frequently before and after thyroidectomy in hyerthyroidism, but these changes are unpredictable and follow no apparent pattern. They are not characteristically large, nor do they tend uniformly to be reduced in size after surgical relief.

May 28

The Value of Sodium Formaldehyde Sulphoxylate in Mercurial Poisoning. By Wm. Egbert Robertson, M.D., and Vernon L. Tuck, M.D.

The drug under discussion has long been known in the commercial world as rongalite, formopone and hydrolite. Apart from its property as a powerful reducing agent, it has the merit of being more stable in the body than sodium thiosulphate and sodium hydrosulphite. Glutathione, also a sulphur compound, is of more value than the other two above named, but lacks in equal degree the ability to preserve renal structure in the presence of mercury. It is this feature above all which seems the most striking property of sodium formaldehyde sulphoxylate.

In acute mercurial poisoning, it is advisable to use the drug intravenously, ten grams in 100 c.c. of water, and in five per cent strength, both by mouth and by enema. The time factor, of course, is of importance, but Dr. Sanford M. Rosenthal, senior Pharmacologist of the U. S. Public Health Service in Washington,

has reported ten recoveries from acute poisoning in which the longest lapse of time was two hours after the taking of the drug. Our cases were of the chronic type, and both responded promptly to the use of the drug given only by vein.

The more striking was a negro, aged 55, admitted to the Philadelphia General Hospital, February 1st, 1934. He developed an eruption for which a druggist gave him medicine. Ten days later a diarrhea set in, resulting in as many as twenty stools a day, containing blood streaked mucus. On admission he suffered abdominal pain, marked stomatitis with profuse salivation, a characteristically offensive breath, a greatly swollen neck incidental to marked cervical adenopathy, with swelling of the submaxillary and sublingual glands. His blood was negative as to Kahn and Wassermann tests. His blood urea nitrogen on February 6, was 100 mgm. per 100 c.c.; creatinin, 6.9. The diarrhea, adenopathy and stomatitis all subsided within three days and his urea nitrogen fell to 28 mgm. and his creatinin to 2.2 mgm. He had underlying renal damage, and his blood count showed marked depression of the bone marrow, as far as the leucocytes were concerned.

The second case was that of a woman, aged 34, pregnant, who had taken an amount of calomel, estimated to be 120 grains. She, too, made a prompt recovery without any ill effects upon the pregnancy, and with normal renal function.

The Use of Sodium Dehydrocholate (Decholin-Sodium) in the Treatment of Certain Allergic Diseases: Preliminary Report. By Harry Shay, M.D., I. S. Ravdin, M.D., and Thomas Fitz-Hugh, Jr., M.D.

Experimental Study of Clinical Vitamin B Deficiency. By K. O'Shea Elsom, M.D.

This paper reports the results obtained when a patient was placed for one year on a diet poor in the vitamin B complex, but adequate in every other known dietary requirement. Protein, caloric and fluid intakes were kept constant, the patient being under careful supervision in the hospital throughout the entire time of observation. Prominent symptoms which developed were: fatigue, anorexia, epigastric distress, constipation, sore tongue, pains and paraesthesias in the extremities. The most striking physical signs were: loss of weight, development of smooth tongue

and of pitting edema, the loss of vibratory sensation in the lower extremities and exaggeration of reflexes. Detailed studies were made of the blood and of cardiovascular and gastro-intestinal function. At the end of six months on the experimental diet, pure preparations of the various fractions of the vitamin B complex were added in series. The effect of the various fractions on symptoms, physical signs and evidences of disturbed function were determined.

There is also briefly described the result of studies made upon another patient who spontaneously developed symptoms and physical signs analogous to those which occurred in the other individual while taking the vitamin B deficient diet.

From the results obtained by these studies it is concluded:

(1) That clinical evidence of deficiency of the vitamin B complex may occur in an otherwise normal individual when there is partial restriction of vitamin B in the diet.

(2) That the clinical signs of such deficiency are accompanied by demonstrable changes in certain aspects of protein metabolism, hematopoietic, cardiovascular and gastro-intestinal functions.

(3) That the newer vitamin B fractions are necessary, in addition to vitamins B_1 and B_2, to relieve such deficiency.

Observations on the Treatment of Peripheral Vascular Disease by Means of Alternate Negative and Positive Pressure. By E. M. Landis, M.D., and L. H. Hitzrot, M.D.

When peripheral vascular disease has advanced to the stage in which the arteries are no longer able to dilate, the usual methods of treatment, including sympathetic ganglionectomy, fail to increase blood flow and often fail to be of benefit. Even when removal of vasoconstrictor tone fails to increase skin temperature, it is possible to increase blood flow in the extremities by applying negative and positive pressure according to the method described by Landis and Gibbon (Jour. of Clin. Investig., 1933, xii, 925). This procedure, when used in treating patients with advanced peripheral vascular disease elevates skin temperature, diminishes cyanosis, alleviates rest pain and accelerates the healing of superficial, indolent ulcers. Evidence is accumulating to show that if patients can be aided temporarily during episodes of pain or ulceration, time is gained for the development of adequate collateral blood flow, and serious mutilating operations can often be avoided.

PROCEEDINGS OF THE SECTION ON MEDICAL HISTORY, JANUARY TO MAY, 1934

January 9

Wm. Osler's Association with the Philadelphia Generl Hospital. By Truman Schnabel, M.D.

Sir Jonathan Hutchinson. By Joseph V. Klauder, M.D.

A brief sketch of the long and successful life of the famous surgeon, 1828 to 1913. Special stress is laid on the wide range of his interests, which comprised, not only the whole animal world, but birds, flowers and fossils, all natural phenomena. The educational museum which he established at his home "Inval," Haslemere, contained objects of interest to illustrate a great variety of subjects; his library contained several thousand volumes, chiefly of general literature and science and many charts, drawings and pictures of historical events.

In the field of medicine he showed the same remarkable versatility. Skin and eye diseases, syphilis, leprosy, diseases of women, nervous affections, all claimed his attention quite as much as general surgery. He made important contributions to all these departments, though his most important and enduring work was on syphilis. For more than half a century he was a diligent observer of all that concerns syphilis in the living subject, and his book "A Clinical Memoir on Certain Diseases of the Eye and Ear Consequent of Inherited Syphilis" is a classic.

He was an extraordinary observer and unrivaled as a suggestive teacher. Perhaps the best proof of his versatility is his work "Archives of Surgery" in eleven volumes. It was an unique publication in many ways; not only was he the editor but the sole contributor. In it he discusses the case records of patients with a variety of diseases, representing almost the entire domain of medicine and surgery, as well as other topics belonging to comparative pathology and veterinarian medicine. He was an indefatigable worker and "as all great teachers he remained a student

and seeker after truth to the end of his days. As all great physicians he was more than a doctor."

PAUL EHRLICH. By Maurice Jacobs (by invitation).

JANUARY 24

COMBINED MEETING WITH SECTION ON GENERAL MEDICINE (*Vide supra*).

FEBRUARY 12

OSLER'S LITERARY OUTPUT, WITH ESPECIAL REFERENCE TO HIS CONTRIBUTIONS TO OUR KNOWLEDGE OF HEART DISEASE AND THE CONTENT OF THE OSLER PATHOLOGICAL COLLECTIONS AT THE MEDICAL MUSEUM OF MCGILL UNIVERSITY, WITH A PERSONAL REMINISCENCE. By Maude E. Abbott, M.D., Curator of the Medical Museum, McGill University, Montreal, Canada.

I. *Statistical.** Osler's literary output, as computed from the Classified Bibliography † of his publications, comprises some 1420 items, of which 26 were in the field of Natural Science (published during his Canadian period), 429 in Comparative and Human Pathology, 555 in Clinical Medicine, 181 were Literary Papers, 162 on Medical Education, 70 on Public Welfare and 19 were Volumes Edited. For adequate evaluation of these it was necessary to differentiate between major and minor communications, i.e., the form of publication. Analysis of the 1420 items showed 461 major original articles (including 28 monographs and 13 books); 303 editorials, book-reviews, obituaries or published correspondence: 180 case-reports, notes and comments, etc.; and 279 specimens or autopsies reported. These figures, and others indicating his relative productivity in the four periods of his career as also the details of his publications on cardio-vascular disease, were presented in tabular form as statistical charts and are very illuminating.

II. A short *Biographical Outline* followed, dealing chiefly with Osler's Canadian period and the formative influences of these

* The figures in this paragraph are subject to final revision before publication of this Address, which will appear in the History Section of the Johns Hopkins Hospital Bulletin.

† Classified and Annotated Bibliography of Sir William Osler's Publications. Sir William Osler Memorial Volume and Bulletin No. IX of the International Association of Medical Museums, 1927, 2d Edition, pp. 473–606.

earlier years. In this connection the importance was stressed of his service as Pathologist to the Montreal General Hospital (1876–1884), where he did over 750 autopsies and made the nucleus of a great pathological collection, the major portion of which, consisting of 150 specimens in perfect preservation, is still housed at the McGill Museum. Nearly all became the subject of articles published, and they are thus a bio-bibliographic asset of immense value.

.III. *Osler's Contributions to Heart-Disease* constituted by actual count as well as in bulk of material nearly one-third of his publications on clinico-pathological subjects. Similarly, 80 of the above specimens, i.e., over half of the 150 in the McGill collection, present lesions of the circulatory system and form a highly representative series, practically all of which formed the starting point for later investigations. As of special importance in this regard were cited his articles on "Aneurysm of the Hepatic Artery,"* "Overstrain of the Heart," etc.* (1877); "Obliteration of the Portal Vein"* (1879); "Of the Inferior Cava"* (1879), and "of the Superior Cava"* (1882–1903); "Fibroid Degeneration of the Heart"* (in angina pectoris) (1880); "Case of Cardiac Abnormalities"* (1880–1886); "Infections, so-called Ulcerative Endocarditis"* (1881). Of prime importance were his Goulstonian Lectures on Malignant Endocarditis* based on 23 cases, 13 of which are seen preserved in this Collection; and his great series of aneurysms of the aorta and its branches* (28 specimens here). Again, "The Cardiac Relations of Chorea"* (1887), a statistical study based on the records of the Philadelphia Infirmary for Nervous Diseases traced its first impetus to at least two of these Montreal cases with autopsy, both of which are seen on the stand.

So also his many articles and monographs on aneurysm, spontaneous, mycotic and dissecting, and his great Practice of Medicine itself, are replete with references harking back to this early Montreal experience, the essentials of which are embodied for our inspection in the extraordinarily valuable Osler Pathological Collection of McGill University.

MEDIEVAL UNIVERSITIES. By David Riesman, M.D., Sc.D.

Of all the contributions of the Middle Ages to civilization the Universities are perhaps the greatest. The actual origin of most

* Specimens in the Osler Pathological Collection of McGill University.

of them is shrouded in mystery. The earliest to enter the medieval picture was Salerno. Salerno was principally a school of medicine largely under lay control, in which respect it differed from the majority of the later institutions. It had a code requiring five years' study. Its chief service was to assist in making the West acquainted with the Arabic literature, a literature that was only in part Arabic, in part Greek in Arabic dress.

Various elements contributed to the founding of Montpellier. The Judeo-Arabic influence was strong. It became a famous medical school with very liberal principles but it eventually lost its preeminence to Paris and other Northern universities.

Bologna, a university founded primarily as a school of law became eventually also a school of medicine. The students were dominant in its management and control; they chose their masters and held them to strict accountability. Padua, of special interest to the English speaking world because of Linacre, Harvey and Mead was an off-spring of Bologna.

Paris, the greatest of all the medieval universities, began about the time of Peter Abelard. Unlike Bologna, it was not a school of students but a school of masters from the beginning. The medical faculty, an arrogant body, had a rigid curriculum. Latin speech was compulsory in the class room and on the campus. From Paris the modern world has inherited the degrees, ceremonies, titles and costumes now in use. Paris in reality is the Alma Mater of all universities in Europe and on the western hemisphere.

March 12

Christopher Columbus and the American Origin of Syphilis.

By R. C. Holcomb, Captain, M.C., U.S.N.

This paper presents arguments against the theory of American origin of syphilis. First, the influence of the superstition regarding the value of "holy wood," guaiacum (lignum sanctum, palo santo, ligno santo, etc.), originally an Indian remedy, is pointed out. Second, the history of the theory ascribing the disease to the first voyage of Columbus is traced. The hazy and confused state of contemporary knowledge regarding Columbus and his voyages is noted. Misinterpretation of the text of Ruiz Diaz de Isla and inaccuracies in the work of Montejo are commented upon.

Third, chronological discrepancies in the interpretation of the so-called epidemic of 1493–1496 are pointed out. The epidemic conditions described were not all syphilis. A plea is made for a better approach to the history of syphilis after freeing it from false theories of American origin.

THE CENTENARY OF RENUCCI'S DISCOVERY OF THE ACARUS SCABIEI. By Reuben Friedman, M.D.

On August 13, 1834, in the clinic of Professor Alibert at the Hospital St. Louis, in Paris, Simon Francois Renucci, a medical student from Corsica, discovered the *Acarus scabiei.*

His was really a rediscovery, however, rather than truly a discovery—in the strict sense of the term, for the presence of the acarus in the lesions of scabies had been known for centuries before. In spite of this recorded knowledge, medical opinion at the time of Renucci was in a state of utter confusion regarding the etiology of scabies. Not only was it the generally accepted opinion of the day that scabies was not due to the *Acarus scabiei,* but the very existence of the parasite was by some authorities categorically denied. Renucci, by clearly indicating that the acarus is not present in the vesicles of scabies, but, on the contrary, is always present in and can be recovered from the slightly elevated end of the burrow, forever ended the confusion that previously reigned regarding the subject.

The history of scabies is divided into three periods: (1) Pre-acarian; (2) Acarian; and (3) Post-acarian. The more important contributions to the subject, from the earliest historical references up to and including the contribution of Renucci, are taken up in chronological order.

APRIL 9

RESEARCHES ON THE LIFE OF TAGLIACOZZO, A 16TH CENTURY PLASTIC SURGEON. By Jerome P. Webster, M.D., New York.

Comparatively little is known of the life of Gasparo Tagliacozzo (Gaspar Taliacotius, Gaspare Tagliacozzi), who wrote the first work on plastic surgery (1597). My interest in him, simultaneous with the acquisition of two editions of his work, took me to Italy in 1931 to endeavor to find further facts relating to his life. With the aid of my secretary, Mrs. Martha Teach Gnudi, who

spent several months of investigation there after my return and again last year, many interesting facts were unearthed. With only one break his family tree was traced for over 200 years; the record of his baptism (March 2, 1545) was discovered; fifteen letters or documents in his own handwriting were found. The nine written in Italian are signed "Gasparo Tagliacozzo." Altogether 159 unpublished documents were unearthed. Records of treatment of fifteen patients, many of whom were among the nobility, were discovered.

Tagliacozzo was born in Bologna, of Bolognese parents and grandparents, probably two or three days before the baptism (March 2, 1545). He studied medicine at the University of Bologna, with Arantius, Cardanus, and Aldrovandus among his teachers. He was working at the Ospedale della Morte in 1568, two years before his graduation in medicine in 1570. He was made Reader in Surgery upon graduation in medicine, graduated in philosophy in 1576, and was appointed to the chair of Anatomy as well as of Theoretical Medicine in 1589. Records show that his academic salary was low but that his stipends for medical services were high. He was Prior of the college three times known to us, several times Tribune of the People, and belonged to the order of Palatine Counts and Golden Knights. After making his last will and testament, he died November 7, 1599, and was buried in the convent of San Giovanni Battista. A funeral oration was delivered November 24, 1599. Following his burial, the nuns had his body exhumed and buried near the walls of the city. There was a trial of those concerned and Tagliacozzo's honor was restored. His corpse was returned from the Church of San Martino to the church of the convent, November 25, 1603.

His book, "De curtorum chirurgia" was published by Gaspar Bindonus in Venice in 1597, who obtained a copyright from the Council of Ten, but the edition was pirated by Robertus Meiettus in Venice in the same year. A Frankfort edition, "Chirurgia nova" appeared in 1598 and the Troschel edition in Berlin in 1831. This work profusely illustrated by woodcuts gave to the world the first scientific treatise on plastic surgery.

THE HISTORY OF ORTHOPEDIC SURGERY IN AMERICA. By DeForest P. Willard, M.D.

May 8

The Mystery Incunable of the College of Physicians. By W. B. McDaniel 2d, Ph.D. (Librarian of the College).

(The speaker's translation of the text was read.) The work is the *Contra Pestem* of Johannes Mercurius Corrigiensis. It does not bear the printer's name, place of printing, or date. Nothing further is known of Johannes Mercurius. The question is as to the legitimacy of its claim to be included in our list of incunabula. On the basis of type it has been assigned to the Press of Besicken, Rome, *ca.* 1493. This type, however, was in use after 1500, making further identification desirable.

Internal evidence points unmistakably to its having been printed in Rome. Of the 34 medicinal herbs listed in the text we have found all in other medical incunabula. Of the 10 minerals with supposed therapeutic value, only one, the *lapis miraculorum,* has defied similar identification. This may be a mystic disguise for the famous bezoar stone known centuries before.

One of the potions recommended, *aqua sancta,* we have not been able to find listed as a therapeutic agent in physical disease. It was, however, as we know, composed of salt and water, and might without disaster have served a not too scrupulous medico or apothecary such as our friend appears to have been.

The predominating characteristic of the tract is its resemblance in literary style and in thought to the writings of the alchemists, particularly Paracelsus. But among the incunabula one finds the well known work of the Arabian alchemist, Geber, and the still better known works of Albertus Magnus, predecessors of Paracelsus by several centuries.

This preliminary investigation has therefore brought forth no concrete evidence to deny the work a place among our incunabula. It remains to push on to a more positive conclusion, if possible, *diversis viis.*

Discussion: *Dr. David Riesman* suggested that further proof of the work's position as an incunable might be found in the fact that its large repertory of remedies did not include the *lignum sanctum,* or guaiac, brought back by Columbus, which thereafter quickly won a predominant place among therapeutic agents. Dr. Riesman suggested, also, that the *lapis miraculorum* might have been the apothecary's name for the mystical "philosopher's stone."

PROCEEDINGS OF THE SECTION ON PUBLIC HEALTH AND INDUSTRIAL MEDICINE

April 27

Active Immunization Against Tetanus Infection with Tetanus Toxoid. By D. H. Bergey, M.D., Director of Research in Biology, The National Drug Company, Philadelphia, Pa.

Preliminary studies of the antigenic effect of tetanus toxoid in guinea pigs showed that three doses of 1 c.c. injected subcutaneously, at intervals of 14 days, caused the development of 0.5 unit of antitoxin per c.c. of serum three months later.

When tested on humans the toxoid produced a local reaction which was undesirable. To eliminate this reaction the toxoid was precipitated with alum-potash solution. The supernatant was discarded and the precipitate was washed twice with sterile salt solution and finally brought to its original volume.

The antigenic effect of a single dose of 1 c.c. of the alum precipitated tetanus toxoid in guinea pigs produced, three months later, 1 unit of antitoxin per c.c.

Thirty-five volunteers were bled and injected with 1 c.c. of alum precipitated tetanus toxoid. Three months later the serums of 32 individuals contained from 0.001 to 0.04 unit of antitoxin per c.c.

Ramon suggested the injection of three doses of plain tetanus toxoid as a primary stimulus. On injury another dose of the toxoid was believed to stimulate antitoxin production and protect against infection.

The 32 volunteers received a second dose of alum precipitated toxoid five months after the first dose. One month later the serums contained from 0.1 to 9.0 units.

One-half of the volunteers had 1.0 unit or more of antitoxin per c.c. of serum. This is more antitoxin than would be administered in giving a prophylactic dose of tetanus antitoxin. The other half of the group had less than 1.0 unit of antitoxin per c.c. and on injury should receive a third dose of toxoid.

The special value of immunization with tetanus toxoid rests on the fact that the immunity is an active one and can be raised to a higher level by injecting another dose. The treated individual is not rendered sensitive to alien serum.

SYMPOSIUM ON NEWER CONCEPTS OF RENAL PHYSIOLOGY AND BRIGHT'S DISEASE
OCTOBER 3, 1934

RECENT DEVELOPMENTS IN THE STUDY OF NORMAL RENAL FUNCTION *

By A. N. RICHARDS, Ph.D., M.D.

The questions which the physiologist of to-day who concerns himself with the kidney must attempt to answer are much the same as those which confronted Malpighi when he discovered the renal corpuscle and Bowman when he found that this constitutes the beginning of the renal tubule.

What processes are at work in the glomerulus? What processes operate in the tubule? How do combinations of these result in the excretion of a fluid which contains the unwanted constituents of the blood—a fluid the amount and composition of which vary from hour to hour or from day to day in accordance with changing circumstances in and requirements of the rest of the body? How is it that the million or more structural units which constitute the human kidney cooperate so exquisitely in the major task of maintaining constancy of composition of the body fluids?

Let me speak first of the glomerulus. Enclosed in the capsule of Bowman, it consists of a lobulated tuft of capillaries each of which is believed to be invested by thin epithelium. Blood enters by the single small afferent arteriole; leaves by the still smaller efferent arteriole. The structural arrangement is such as to have led the older physiologists to surmise that the blood pressure within these capillaries must be higher than that in systemic capillary systems: hence that it might serve as a mechanical, though living, filter through which is expressed from the blood by the blood pressure a fluid which is the equivalent of blood plasma minus its non-diffusible, colloid constituents. This idea was denied by many physiologists of the later decades of the past century and is still denied by a few physiologists of high standing of the present day. They conceive that the epithelium which invests the glomerular capillaries has active power of taking out of the blood by a process of secretion the substances which should be excreted.

* Read before the College October 3, 1934.

The most important facts upon which this latter view is based are: (1) That when a kidney is excised while in process of excreting a soluble and diffusible dye like indigo carmine, sections of the kidney do not reveal the presence of the dye in the capsular space. I do not believe that this evidence is good; for the dilution in which the dye exists in a filtrate from plasma is so great that one would not expect it to be visible in microscopic sections; and when one fills the capsular spaces of a kidney with dye solutions of equivalent concentration and makes careful sections as Bensley, for example, has done, search of the capsular spaces reveals no color.

(2) The fact, found by Höber, that poisons like KCN or anaesthetics lessen the rate at which fluid passes through the glomerular membrane is taken to mean that some vital process capable of being reversibly suppressed by the poison is normally responsible for glomerular function. The possibility that such an effect is due to changes, induced by the poison, in the capillary pressure or in the permeability of the glomerular membrane has not been excluded in these experiments.

Let me now state some of the more recently established grounds for belief that the glomerulus is a filter—not a secreting structure.

1. Is the glomerular capillary blood pressure, as surmised by Ludwig in the '40's and Starling in the '90's of the last century, high enough to act as a filtration pressure? Hayman succeeded in actually measuring the glomerular capillary pressure in frogs; White did it later in Necturi. The results showed that the blood pressure within glomerular capillaries is more than half as great as the aortic pressure: i.e. amply able to bring about the separation of a protein-free filtrate from blood plasma. The plan of structure of the mammalian glomerulus is the same as that of the amphibian; mammalian blood pressure is much higher. I have no hesitancy in expressing the conviction that in mammals as well as in frogs an effective filtration pressure is available for the production of a filtrate from the blood as it flows through the glomerulus.

2. The composition of glomerular fluid—is it that of a filtrate or does it resemble the product of selective secretion? In amphibia and reptiles we are now able to extract, during life, small quantities of the fluid which is separated from the blood as it flows

through the glomerulus. When suitably tested it is usually found to be protein-free, though sometimes it contains traces of protein.

It has been possible to subject glomerular fluid from amphibia and reptiles to quantitative analysis. The methods used are refinements of standard methods of biochemistry—refined to be applicable to the minute amounts of fluid which can be obtained in a single experiment. Their reliability has been thoroughly tested and found to be as great as the quantitative chemist is accustomed to demand and expect. Having applied these methods to glomerular fluid collected without contamination from frogs and Necturi in hundreds of experiments, it is possible to say that this fluid is approximately identical in composition with that of a protein-free filtrate from blood plasma in respect of total concentration of dissolved solids, and of dissolved electrolytes (salts); concentration of chlorides, of phosphates (inorganic), of urea, of glucose, of uric acid, of creatinine and of the dyes, phenolsulphonephthalein, indigo carmine and neutral red, if these have been injected and are being excreted by the kidney. The reaction of glomerular urine, accurately measured, is the same as that of the blood plasma.

Some of these are substances which the animal excretes rapidly and completely; others, like sugar and chloride, he excretes only in traces. Yet all alike leave the blood in the glomerular fluid in the concentration in which they exist in plasma. In a word, no evidence is obtained by study of the composition of glomerular fluid of the existence of any selective process such as might be expected in a secreting structure.

The glomerulus has the appearance of a filter; effective filtration pressure is present in it; the fluid which is separated from the blood flowing through it has the composition of a filtrate; therefore we seem obliged to conclude that the glomerular process is one of filtration.

These facts were determined by study of amphibia. Is the conclusion applicable to mammals and to man? To this question I can only say that the architecture of the glomerulus in the two orders is the same; that specialized methods of histological staining reveal no fundamental differences; that a large volume of indirect experimental evidence supports belief in filtration in the mammalian kidney.

Have we any knowledge of the volume of glomerular filtration? Is the process quantitatively adequate to account for the excretion of normal constituents of the urine?

In a frog we can often collect 0.001 cc. from a single glomerulus in an hour. In a number of experiments it has flowed at rates approximating 4 cu. mm. per hour. The number of glomeruli in a frog's kidney may be from 1000 to 15000 according to the size of the frog.

Multiply the number of glomeruli by the rate at which filtrate is formed in one; multiply this by the concentration of a single constituent (e.g., urea) in the filtrate, i.e., plasma; the figure obtained represents the glomerular clearance of urea from plasma per unit of time.

Collect urine from the animal for measured time; determine how much urea is in it, and it will be found that the amount of urea excreted by the whole kidney can well be contained in the calculated volume of glomerular filtrate.

From this we may conclude that it is not necessary to assume the existence and operation of any other process than that of glomerular filtration to account for the separation from the blood of the urea which is actually eliminated by the frog's kidney.

If the same sort of calculation is applied to the glomerular excretion of certain foreign substances (e.g., neutral red), a different conclusion is forced. In one of our experiments the volume of glomerular filtrate in a frog, calculated to contain the amount of neutral red excreted in an hour, worked out to be 60 cu. mm. per glomerulus per hour. It is not possible to conceive that as much filtrate as this can be formed; hence we must assume that in the excretion of neutral red another mechanism operates in addition to that of glomerular filtration. This must be located in the tubule; we call it secretion.

A similar state of affairs is, I believe, encountered when we attempt to make similar calculations and deductions with respect to the mammalian and human kidney. It is permissible to believe that all of the creatinine, urea, uric acid or phosphate which is excreted by the kidneys of a man in a given time is contained in the glomerular filtrate formed during that time. Seven cu. mm. per glomerulus per hour would be enough; but when phenolsulphonephthalein is excreted, similar calculation indicates that the volume of blood filtrate required to yield the amount excreted

may be scarcely less than the total amount of blood which flowed through the kidney in that time.

We are not yet forced by experimental evidence, in so far as I know, to believe that secretion by the tubule, in addition to filtration through the glomerulus, is necessary to explain the renal excretion of normal urinary constituents; we are, however, forced to believe that it is necessary to explain the excretion of certain foreign substances of which phenolsulphonephthalein is an example.

If it is true that the volume of glomerular filtrate is much greater than is the volume of urine which issues from the ureter, then it follows that a large volume of fluid must be taken back into the blood by processes of reabsorption. In man it can be calculated that the creatinine, for example, in 1 cc. of urine excreted in 1 minute is equal to that contained in 100 cc. of plasma or glomerular filtrate. In such a case 99 cc. of fluid must be reabsorbed from the tubules of the kidney in that minute.

Direct evidence of the reabsorption of water from the tubules can be obtained in amphibia; for example, in collecting fluid by means of capillary pipettes inserted into different parts of the nephron of the frog or Necturus it is found that collection is usually far slower from the distal tubule than from the proximal; and from the proximal tubule than from the glomerulus. The glomerular filtrate diminishes in volume as it flows through the tubule.

Or, let a dilute solution of phenol red be injected into the lumen of a single tubule of the frog's kidney; compress the tubule with a microscopic rod to keep the solution from flowing on into the ureter. The color becomes more intense—from 10 to 20 times as concentrated as that of the original solution. This can occur only as the result of the escape of water from the tubule.

In mammals this process of reabsorption of water must in large part require the expenditure of energy, because of the high osmotic pressure against which it takes place. It is proper therefore to regard it as the result of active processes in the tubule cells—a secretion, if you choose, of water from the lumen of the tubule into the blood.

Even more direct evidence can be obtained of the reabsorption of some of the dissolved constituents of the glomerular filtration, as this passes down the tubule. Both sugar and sodium chloride

are contained in the glomerular filtrate in the concentration in which they exist in blood. Neither is present in more than traces in the urine as it leaves the kidney. Nearly all of the glucose and sodium chloride separated from the blood in the glomerulus is taken back into the blood which supplies the tubules. Both of these processes must be active—i.e., require activity on the part of the tubule cells. Concerning the nature of this activity I can say nothing.

Concerning the parts of the tubule in which these reabsorptions occur something can be said. In frogs and Necturi it has been possible to collect glomerular filtrate after it has flowed through different fractions of the length of the proximal convoluted tubule. That taken about one-eighth of the way down has some 25 per cent less glucose in it than has the glomerular filtrate; one quarter, 50 per cent less; one half, all gone. The proximal tubule in amphibia is responsible for restoring glucose of the glomerular filtrate to the blood. The distal tubule does not have this power.

On the other hand, fluid which has flowed through the entire length of proximal tubule contains as high a concentration of Cl as does plasma. No selective reabsorption of Cl takes place in the proximal tubule. As soon, however, as it makes its way through the distal tubule the Cl concentration begins to decrease. Selective reabsorption of Cl takes place in the distal tubule.

Similarly the reaction of the glomerular fluid which is the same as that of plasma, does not change until a certain area in the distal tubule is traversed.

These statements may be regarded as the beginnings of more precise knowledge concerning the distribution of functions among the different parts of the renal tubule.

One other item is to be mentioned: i.e., the quality of the renal tubule which permits it to retain within its lumen highly diffusible constituents of urine in a state of high concentration. Creatinine in urine may be 150 times as concentrated as in blood plasma; urea 100 times. Both are exceedingly diffusible through artificial membranes. The tubule wall possesses a specific quality, associated with its vitality, which prevents these substances from diffusing out. It is this quality which makes the tubule an excretory structure. When the tubule is damaged, as by renal poisons, e.g., mercury, this quality is decreased or diminished.

I know of few more striking demonstrations than this. Let a frog be poisoned with $HgCl_2$ in minute, non-fatal dose; examine the kidney during life. The glomeruli are active, glomerular filtrate is being formed, but no urine issues from the ureter. Put a solution of phenol red into the tubule; block the tubule to prevent exit into the ureter. Instead of becoming concentrated in the lumen of the tubule, it can be seen to diffuse through the wall into the surrounding tissues and gradually disappear.

This quality of impermeability to diffusible substances in the direction lumen to blood seems to me to be far more important than the attention given to it in the literature would indicate. Partial or complete abolition of it by poisons or disease would inevitably reduce the excretory capacity of the kidney by allowing the glomerular filtrate to be drawn back unselectively into the blood as a result of the osmotic pressure of the blood proteins.

MODERN CONCEPTION OF THE PATHOLOGY OF BRIGHT'S DISEASE *

By BALDUIN LUCKÉ, M.D.

Under the common heading Bright's disease have been grouped together a number of disease entities dissimilar in pathogenesis and in morphology. But these several different conditions may bring about during certain stages of their development disturbances of renal function quite similar in character. It is for this reason that the collective term Bright's disease continues to be useful and convenient, for it expresses the frequent clinical similarity of certain definite forms of renal disease. Opinions in the past have differed greatly as to the nature of the conditions that are included in this group. At the beginning of the century, and even within very recent years, Bright's disease meant to most pathologists *nephritis,* that is to say, inflammation of the kidneys. The then current concept of inflammation is reflected by such terms as parenchymatous nephritis, a supposed inflammation of the epithelial cells of the tubules, and interstitial nephritis, a supposedly primary overgrowth of the fibrous stroma, which was thought eventually to choke the more delicate functioning tissue.

The obvious tubular and interstitial changes so dominated the views regarding the nature of Bright's disease that the more

* Read before the College October 3, 1934.

subtle lesions in the glomerular tufts and their arterioles received little or no attention. However, with advance of knowledge in the field of general pathology, it became increasingly clear that epithelial cells cannot themselves be the seat of inflammatory reactions and that so-called parenchymatous inflammation is in fact a degenerative process. Furthermore it was demonstrated by experiment that overgrowth of fibrous stroma is not the cause but the consequence of decay of more highly specialized cells. The original significance of the terms, parenchymatous and interstitial nephritis, was further undermined by the demonstration first, that both tubular and interstitial changes may be the result of glomerular lesions; secondly, that some forms of parenchymatous nephritis are purely degenerative processes; and thirdly, that sclerosis of renal arterioles may bring about disturbances identical with what had been called interstitial nephritis.

In this unsatisfactory and confused state attempts to correlate between functional and structural disturbance were hopeless. Then appeared, in 1914, the now famous monograph on Bright's disease by the clinician Volhard and the pathologist Fahr.* Here for the first time were collected the advances that had been made in renal pathology, and these advances were amplified by Volhard's and Fahr's joint studies in the clinic and the pathologic laboratory. They proposed a concept of Bright's disease based upon the true pathologic nature of the several conditions embraced by this term, a concept that has been elaborated and refined but which in its essentials has been almost universally adopted. The principle of their views regarding the nature of Bright's disease is suggested by the nomenclature they advocated: *nephritis,* by which is meant any variety of primarily non-suppurative, inflammatory, bilateral renal disease; *nephrosis,* any primarily degenerative variety; and *nephrosclerosis,* any variety primarily due to sclerosis of the arterioles.

I shall now attempt to sketch the picture of Bright's disease which has emerged from the immense amount of work stimulated by the studies of Volhard and Fahr.

* Volhard, F. and Fahr, T.: Die Brightsche Nierenkrankheit, Berlin, 1914. More recent publications by the same authors are: Volhard, F., Die doppelseitigen hämatogenen Nierenerkrangungen, in Bergmann u. Staehelin, Handb. der inneren Medicin, 2 Ed., vol. 6, Berlin 1931. Fahr. Th., Pathol. Anatomie des Morbus Brightii, in Henke u. Lubarsch, Handb. d. spez. pathol. Anat. u. Histol., vol. VI, parts 1 and 2, Berlin, 1925 and 1934.

The *nephritic* group is by far the best understood and least controversial. The primary and dominant lesions are in the glomeruli, hence the synonym glomerulonephritis which expresses clearly the nature and seat of the essential disturbance. I shall restrict my discussion to the diffuse type of this disease. The glomerular lesions are definitely inflammatory; they represent reactions to some injury. Due to injury the permeability of the glomerular filters is altered; they become more or less leaky and permit the escape of such substances as blood proteins and erythrocytes. The tissue reaction brought about by the injury leads to accumulation of leucocytes in the glomerular coils, to a proliferation of the capillary endothelium, to the formation of fibrin-like material in the capillary lumen, and to multiplication of the extracapillary glomerular epithelium. Because of these intra- and extra-capillary changes the glomerular filters become more or less obstructed, and in proportion to the degree of obstruction there is reduction in filtering capacity and hence failure of excretion of various substances.

Obstruction of the renal filtering system brings about still further disturbances. The glomeruli are parts of the renal units, the nephrons. The three components of the nephrons—afferent arterioles, glomeruli and tubules—are interdependent; serious injury or destruction of one of the component parts inevitably damages the others. Thus, the nutrition of tubular cells is furnished by peritubar capillaries which arise from the efferent glomerular arterioles. Reduction or cessation of glomerular circulation therefore leads to diminished nutrition of the tubular cells, to degenerative changes and eventually to atrophy, and disappearance. During the decay of these richly protoplasmic elements there are liberated certain growth-promoting substances which stimulate to proliferation the hitherto resting fibrous stroma, a tissue of low rate of metabolism requiring far less nutrition than the more highly specialized parenchymatous cells. The involvement of the third component of the nephrons, the afferent arterioles, manifests itself by gradual closure of the lumen as the glomerular circulation ceases.

All of the complex changes in renal structure and renal function are then referable to primary glomerular injury and reaction to this injury. The character of the glomerular lesions is always the same: leakage and obstruction of the filtering system. The

great variety of structural and functional disturbances that we observe in glomerulonephritis are explainable solely by the extent and duration of the primary lesions.

We must now inquire into the nature of the injury and the inflammatory response. There is much presumptive evidence that the primary injurious agent in many cases is a protein derived from streptococci. It has long been known that acute glomerulonephritis most frequently follows a streptococcic disease such as sore-throat, scarlet fever, or otitis media. But streptococci themselves have never been found either in the urine nor in the kidney tissue of fatal cases. On the other hand toxic products of streptococci have been isolated, and such success as has been at tained in attempts to produce glomerulonephritis in animals has been achieved mainly by the use of streptococcic or other proteins.

Now it is becoming well known that when foreign proteins gain entrance to the tissue there may develop a condition of altered response to the protein antigen, a state of allergy. As Professor Rich has so trenchantly stated, there is an increasing body of evidence that various lesions and symptoms which were formerly supposed to be the direct result of bacterial poisons are actually the results not so much of the bacterial poisons but of a hypersensitive state of tissue reactivity engendered by bacterial proteins. During infection the tissues ordinarily become more or less hypersensitive to the protein of the infecting micro-organism. When this hypersensitiveness has developed, the tissues will be locally damaged or even killed by amounts of the bacterial protein which are harmless to the normal body, and at the site of local damage the inflammatory response will be extraordinarily violent. Indeed, as was recently again demonstrated by beautiful experiments of Schultz and Swift from the Rockefeller Institute, antecedent infection may alter tissue reactivity not only in a specific sense to substances derived from the causative agent, but also non-specifically to unrelated antigenic material. Details of these so-called allergic reactions cannot here be discussed.* Their importance has for some time been recognized in tuberculosis, rheumatic fever, pneumonia and certain other infections. It is highly probable that they play a dominant rôle in the pathogene-

* The reader interested in the nature and rôle of bacterial allergy is referred to the excellent papers by A. R. Rich: *Lancet*, Sept. 2, 1933, 521; and by M. P. Schultz and Homer F. Swift: *J. Exp. Med.*, 1934, 60, 323.

sis of glomerulonephritis. Clinical evidence to this effect is furnished by the observation that acute glomerulonephritis arises not at the height of a streptococcic infection but during its subsidence or during convalescence, that is to say, at a time when sensitization may have developed. Experimentally, such glomerular lesions as have been produced have invariably been produced in animals previously rendered allergic to some protein.

The question naturally arises: Why should the site of principal damage be in the glomeruli? Allergic reactions are to a great extent capillary reactions; the changed reactivity is associated with increased capillary permeability, and with increased stickiness of the capillary endothelium. A more or less generalized edema with relatively high albumin content is frequently encountered in active nephritis, and is thought to be evidence that the glomerular capillaries are not exclusively damaged but that capillary damage is widespread. However, the peculiar position and structure of the glomerular capillaries makes it likely that they retain and be damaged by bacterial proteins to an exceptional degree. Indeed in the narrow and tortuous glomerular coils these toxic substances of large molecular size are concentrated to the extent to which fluid is removed from the blood by filtration.*

When because of previous infection a state of hypersusceptibility to some bacterial or other protein is once established, subsequent minor infections may continue or repeat the original damage. The degree of allergy, the frequency of infection, the rapidity of tissue destruction, the rate of depletion of reserve tissue, these and others are variables which are now thought to be responsible for the extraordinary complex pathologic picture of diffuse glomerulonephritis.

We now come to the *nephrotic* group. Herein are included a number of unrelated forms. There are acute nephroses that seem invariably to terminate in complete recovery or death; such are the simple nephroses accompanying most infections and intoxications, the necrotizing nephroses of bichloride and other chemical poisons, and the eclamptic nephrosis that occurs in toxemia of pregnancy. Then there are chronic nephroses such as amyloid nephrosis and the so-called true or lipoid nephrosis; these forms begin so insidiously that no acute stages are known.

* Gray, J., *J. Pathol. and Bact.*, 1928, **31**, 191.

The links that bind together this heterogeneous group are structural changes which are usually interpreted as primarily degenerative in character: there is no significant inflammatory reaction, and no obstruction in either glomerular or arteriolar circulation.* In general the tubular lesions are histologically more prominent than the glomerular, but it must not be thought that in all forms the tubular lesions are the dominant pathologic states. Indeed, in only two forms of nephrosis are tubular changes mainly responsible for the functional disturbances, namely in the necrotizing nephroses and the structurally somewhat similar eclamptic nephrosis. In these forms we have disturbances that may simulate those of acute glomerulonephritis: anuria, some hypertension, retention of nitrogenous waste. Morphologically there does not seem to be any interference with glomerular blood-flow; the obvious changes are necrosis of the tubular epithelium. Thanks to the beautiful experiments of Professor Richards † this apparent paradox has been shown to have a simple explanation; the necrotic tubular epithelium no longer possesses selective resorptive properties, but, like a dead and freely permeable membrane, permits resorption of all of glomerular filtrate into the peritubar capillaries through forces probably purely osmotic in character.

In the case of all other nephroses there also are tubular changes, never of the extreme character as in the above, but generally regarded as kinds of degeneration: albuminous, hyaline, fatty and so forth.

In the last several years a number of investigators have brought forth experimental evidence indicating that many such tubular alterations are not degenerations in the usual sense of the word—deterioration of cellular vitality or function—but represent resorption of materials abnormally present in the glomerular filtrate.‡ It now seems very probable that the cell protoplasm in some forms of nephrosis is not essentially damaged, but is merely resorbing proteins, fats and lipoids from the glomeru-

* Amyloid nephrosis forms an exception; in rare cases the deposits of amyloid around glomerular capillaries or in arteriolar walls may be so excessive as to interfere with circulation. In these cases the functional disturbances become very similar to those of glomerulonephritis.

† Richards, A. N., *Transact. Assoc. Am. Physicians*, 1929, **44**, 64.

‡ Dunn, J. S., *Journ. of Pathol. and Bact.*, 1934, **39**, 1.
Terbrügen, A., *Beitr. path. Anat.*, 1931, **86**, 235.

lar filtrate in which these substances are believed to exist in increased concentration.

The essential lesion of most varieties of nephrosis appears to be glomerular, though the nephrotic glomerular lesions are very different from those of glomerulonephritis. There is present no significant inflammatory reaction and no demonstrable interference with capillary flow. Indeed the tufts may show no recognizable change of structure. Yet there leaks through those apparently undamaged filters a quantity of albumin that may amount to as much as 50 gm. per day. There is no reasonable doubt that the proteins actually escape through the glomerular capillaries, and that they are unchanged plasma proteins. Now, we must remember that the permeability of any capillary system may be so altered as to permit the passage not only of protein but of formed elements as well, and that we have as yet found no criteria by which such an increase of permeability may be detected structurally. It need therefore not be a matter of surprise that, under certain conditions, leaky glomerular capillaries may have quite a normal appearance.

What brings about the change in glomerular permeability is at present unknown. The resulting functional disturbances are characteristic and are spoken of as the *nephrotic syndrome:* massive loss of albumin through glomerular leakage, consequent depletion of plasma albumin, inversion of the albumin-globulin ratio, lowering of colloid osmotic pressure of plasma, and, as a consequence thereto, edema. No one questions the existence of this syndrome; but there has been much controversy as to the kind of Bright's disease which it accompanies. This much is certain: first, the nephrotic syndrome, like all pathologic states, may vary greatly in degree; and second, its occurrence is not confined to a particular variety of Bright's disease. We may find the disturbance especially in amyloid nephrosis; in that very rare disease the so-called true, pure, or lipoid nephrosis; and, even more frequently, in the course of so-called subacute or chronic active glomerulonephritis. These are three distinct forms of renal disease: they have neither etiologic nor pathogenic relation; in each there are specific morphologic changes, and each has its own more or less characteristic course. However, their individuality may be masked by the occurrence of a syndrome common to all.

In the final group of Bright's disease, the *nephroscleroses,* are included two varieties which have been termed benign and malignant nephrosclerosis. In both the essential lesion is constriction and final occlusion of the afferent arterioles with resulting secondary atrophic changes in the glomeruli and tubules. Both forms are accompanied by persistent hypertension. The benign form generally runs a course extending over decades, and rarely terminates in renal failure. The course of the malignant variety is as rapid or even more rapid than is the usual course of glomerulonephritis, and renal failure is the rule.

There are at present two main questions concerning nephrosclerosis: What is the relation of this disease to hypertension; and, are benign and malignant nephrosclerosis two distinct entities, or does the latter merely represent an accelerated form of a single disease? With respect to the first question we find opposing schools of thought; the majority hold that hypertension precedes and is responsible for the renal lesions; on the contrary, some observers believe that the arteriolar renal changes are primary and that hypertension is consequent to them. The question must be decided by experiment, and this until recently has been lacking.

It is an established fact that sclerosis of arterioles and small arteries may be limited to the kidneys; indeed even when the process is more widely distributed it practically never extends beyond the vascular system of a few organs. Wherever arteriolar sclerosis occurs the circulatory capacity will be locally reduced, and a local ischemia will result. The question then is, Can ischemia limited to the kidney alone lead to persistent hypertension? During the past year Professor Goldblatt and his associates * have devised ingenious experiments which will allow a means of studying the pathogenesis of hypertension that is associated with renal vascular disease. They have shown that permanent constriction of the renal arteries of both kidneys of dogs, by means of a special clamp, was followed invariably by an elevation of systolic blood pressure which persisted for as long as 15 months, that is to say up to the time of their report. On the contrary, great permanent constriction of arteries of other parts of the body did not induce persistent significant elevation of blood pressure. These experiments indicate that, in dogs, at least, ischemia localized to

* Goldblatt, H., J. Lynch, R. F. Hangal and W. W. Summerville: *J. Exp. Med.*, 1934, 59, 347.

the kidneys is a sufficient condition for the production of persistent hypertension. When such constriction is of moderate degree the elevated blood pressure is unaccompanied by signs of renal failure; severe constriction on the other hand leads not only to hypertension but to serious disturbances of renal function and uremia. These experiments support the validity of the contention that renal arteriolar sclerosis may play an important rôle in the establishment of hypertension.

Of course it must not be thought that hypertension is invariably or solely due to such sclerosis. In fact it is well known that a variety of less common disease processes in some manner induce a persistent elevation of blood pressure. The more familiar examples of such processes are certain tumors of the pituitary and of the adrenal cortex, anemia of the medulla oblongata due to sclerosis of its nutrient vessels, marked increase of intracranial pressure, and certain disturbances of the carotid sinus.

The last question concerns the nature of the two varieties of nephrosclerosis. Morphologically, benign and malignant nephrosclerosis are two distinct processes. In the former the hyaline changes in the arteriolar walls are more exaggerated, but otherwise similar to changes seen in the arterial system in advancing age; the glomerular and tubular lesions are simple atrophy. In the malignant variety the vascular lesions are entirely different. Patches of necrosis of the arteriolar wall, often associated with periarteritis, furnish a picture not unlike that characteristic of the vascular lesions of rheumatic fever and of certain other infections. The glomerular tufts also show necrotic areas and, as a result, distinct secondary inflammatory reactions. All stages of such necrotic lesions and subsequent inflammatory reactions may be seen, recent as well as healed. Structurally at least the two varieties of nephrosclerosis appear to be separate entities. Moreover, while benign nephrosclerosis is usually a disease of midlife or advancing age, malignant nephrosclerosis usually occurs in the relatively young; indeed it is not rare in childhood. The age distribution of the malignant type may be likened to that of glomerulonephritis, while the age distribution of benign nephrosclerosis coincides with that of other manifestations of the arteriosclerotic group of diseases.

As in all other varieties of Bright's disease, we cannot hope for

a final interpretation until we have learned to produce the lesions experimentally.

The concept of Bright's disease, as I have briefly outlined it, will no doubt undergo much change with advance in knowledge. However, even at present, it permits us to correlate between functional and structural disturbances to a more satisfactory degree than has been possible in the past.

NEWER METHODS OF DETERMINING THE NATURE AND EXTENT OF RENAL DISEASE *

By EUGENE M. LANDIS, M.D.

(*Abstract*)

As soon as renal disease is suspected two questions present themselves: First, what is the nature of the disease, acute or chronic, inflammatory or degenerative? Second, is renal function as a whole diminished slightly, moderately or conspicuously? The prognosis and treatment of a first attack of glomerulonephritis involving previously normal kidneys will be different from the prognosis and treatment of an acute recrudescence involving kidneys permanently damaged as a result of antecedent disease.

The original description of Bright's disease was based primarily upon painstaking examination of the urine. Even now, according to Addis, most information concerning the nature of renal abnormality in patients can be obtained from a quantitative study of highly concentrated, acid urine collected under standard conditions. Such examination reveals the blood casts and hematuria of acute glomerulonephritis, the degenerative casts and proteinuria of nephrosis, and the diminished concentrating power of chronic renal disease.

Among the tests for detecting early renal insufficiency clinical data are available for a comparison of the concentration test, urea clearance, creatinine clearance and the phenolsulphonephthalein test. From the practical standpoint the creatinine clearance provides no more information than does the more commonly used urea clearance. The study of phenolsulphonephthalein elimination in two one-hour periods is slightly less sensitive than the urea clearance, but when urine is collected at 15-minute intervals the phenolsulphonephthalein test is at least as sensitive as the urea clearance.

* Read before the College October 3, 1934.

No single form of examination will provide complete information concerning the nature and extent of renal disease. Quantitative studies of the urinary sediment reveal early renal disease while the ordinary clinical tests may still yield normal results. Phenolsulphonephthalein elimination studied in short periods, urea clearance and creatinine clearance are approximately equally sensitive in showing diminished renal function, but in single examinations they do not differentiate temporarily reduced function from which the kidneys can recover, and permanently reduced function from which there can never be complete renal recovery.

Most information results from comparing data obtained (1) by careful study of urinary sediment; (2) by an adequate concentration test; and (3) by one or more of the other clinical tests of renal function. Finally it must be remembered that no laboratory test can replace a careful history and general examination. While it is usually impossible to make a complete diagnosis of a renal condition by clinical methods alone, it is equally impossible, and even hazardous, to depend upon laboratory findings at the expense of general clinical study. The nature and the extent of renal disease can be determined most adequately by the judicious combination of clinical and laboratory forms of study.

A DISCUSSION OF NEPHRITIS FROM A CLINICAL AND THERAPEUTIC STANDPOINT *

By DR. HAROLD W. JONES, M.D.

(*Abstract*)

The clinician owes a great debt to the physiologist, pathologist, and physiological chemist for clearing many obscure and controversial points in the disease nephritis. Physical chemistry is not sufficiently advanced to permit of more than minimum application of its quantitative laws. Nephritis is a generalized disease, giving rise secondarily to diseases of other organs.

Comparing the number of cases of uncomplicated chronic nephritis admitted to Jefferson Hospital in the last two decades, there has been a decided decrease, particularly since 1928. Previous to 1928 ten per cent of the medical admissions were for chronic nephritis; since 1928 approximately five per cent. This is due probably to a better understanding of the disease, removal

* Read before the College October 3, 1934.

of focal infection, more sensible treatment of the early case, increased knowledge and use of the electrocardiograph, and the exclusion of cases of advanced pernicious anemia.

In thirteen years of private practice most patients, who came diagnosed as nephritis, proved to be some other condition. The most common chief complaints of the ambulatory nephritic patients in order of their frequency were nocturnal frequency, hypertension, albuminuria, and edema.

Treatment

No fixed rules can be given for the treatment of nephritis. Each case is an individual problem. Water is the best diuretic. In acute and chronic nephritis a moderate quantity is to be preferred, avoiding extreme limitation or tremendous excess. The value in the necrotic type of nephrosis of free intravenous administration of fluid, especially of glucose solution, up to 5 or 6 liters daily, deserves attention.

Sodium chloride in moderation, up to 7 to 10 grams a day, is recommended, supplemented by saline solution by hypodermoclysis or intravenously in cases of dehydration. Hypertonic saline solutions are dangerous, and extreme salt-poor diet routinely in hypertension is poor therapy.

Sodium bicarbonate may allay the dyspnea of chronic nephritis. Ten per cent calcium gluconate solution intravenously may be used to relieve muscular twitching and tetany. Adequate protein intake and blood transfusion are useful for combating the anemia of chronic nephritis.

Diuretics

Ammonium nitrate or chloride, salyrgan, euphylline and thyroid extract are the diuretics of choice. The ammonium salts stimulate a rapid elimination of chloride, but in so doing a certain amount of sodium and water from the tissues is also eliminated. Diuresis will not occur with these salts when there is insufficient available base (sodium).

Salyrgan increases the transference of water from the tissues to the blood stream. It diminishes tubular resorption. In conjunction with the ammonium salts it is most efficacious in cardiac edema and nephrosis. Diuretics are not indicated in acute nephritis.

Euphylline increases the number of glomeruli through which the blood may flow at a given time. It also increases the transit of fluid and salt from the tissues to the blood stream. It is sometimes active when salyrgan is not. Salyrgan intravenously has produced death.

Thyroid extract accelerates the transition of salt and water from the tissues. It is best used in chronic nephrosis in doses from 3 to 15 grains daily in conjunction with a high protein diet.

Diet

The red-meat-free, low-protein diet is contraindicated. Daily intake of 30 to 40 grams of protein is necessary to take care of waste of body protein. In chronic glomerulonephritis with nitrogen retention the protein intake should be at least this much. With a nephrotic syndrome 60 to 100 grams will often affect the patient favorably. In chronic nephrosis 140 to 200 grams daily is usually sufficient to control the edema and restore osmotic equilibrium. Acacia intravenously to restore the osmotic equilibrium should not be used except in carefully controlled cases. Sufficient carbohydrate must be given to prevent starvation ketosis. As a rule, a low fat diet is better tolerated, particularly in those cases in which hypertension is a prominent feature.

Conclusion

We have sketched rather briefly some of the salient points in the therapy of this complex disease. From the papers that have been presented this evening it is evident to you, I am sure, that physiology, pathology, and physiological chemistry have played an important part in determining a logical clinical consideration and therapy of this disease. The advance in therapy and clinical medicine has not been as significant as the advances made by other branches of our profession. However, we hope to profit by the splendid researches in these related fields.

THE HYPOTHALAMUS: ITS SIGNIFICANCE FOR VISCERAL INNERVATION AND EMOTIONAL EXPRESSION

The Weir Mitchell Oration *

By S. W. RANSON, M.D., Chicago

I am always happy to come to Philadelphia which for many years has been the Mecca of American Neurology. It was here that Weir Mitchell was born. Here he lived and worked, and from this city his influence extended throughout the land. His work was finished twenty years ago, but his influence continues unabated. It has come down to us through Mills, Dercum, and Weisenburg, Burr, Spiller, and Frazier. No other city in America has contributed so many leaders of the first order to this branch of medicine.

On the walls of the Hall of Fame of the newly erected Montreal Neurological Institute there have been inscribed the names of a few men chosen from all the world as those who have contributed most to our knowledge of the nervous system. On this roll of honor we find the name of Weir Mitchell.

Like a mountain peak, which stands out in full relief only when seen from a distance, the majesty of Weir Mitchell's personality is even more evident to us than it was to his contemporaries although he was highly honored and greatly loved in his own day. This has been expressed very well by Mrs. Burr[1] as follows: "Those who knew Dr. Mitchell during the eighties and nineties were wont to speak of him as the embodiment of shining professional success. Good fortune seemed to crown everything he did. His practice was enormous, his cure known throughout Europe. He was honored as a toxicologist, as a neurologist, as a writer. His novels were widely successful, his poetry highly praised. He was much beloved. The community held him as First Citizen, as no man has ever been held since Franklin. And all these achievements had been enriched by a personality, handsome, distinguished, lordly, and not lacking in panache, that waving plume of picturesqueness which stands out above a crowd."

* Read before the College October 17, 1934.

[1] Burr, Anna Robeson, "Weir Mitchell: His Life and Letters." New York, Duffield & Co., 1929.

New problems always had a great fascination for Dr. Mitchell's active mind and for this reason it has seemed appropriate to choose as the subject of this address a topic which has only recently begun to receive attention: the hypothalamus and its significance for visceral innervation and emotional expression.

A part of the brain, known as the hypothalamus is intimately connected with the pituitary gland or hypophysis. One or the other of these two structures, or both together, exert an important control over the utilization of sugar, fat, and water in the body. Diabetes insipidus and Fröhlich's syndrome are due to disturbances of this hypothalamico-hypophyseal mechanism. Damage to the hypothalamus may result in prolonged somnolence and in a disturbance in the regulation of body temperature. This region, therefore, presents many problems for clinical investigation, problems which can also be approached in the experimental laboratory.

The experiments to be reported tonight throw light on some of these problems, especially on the relation of the hypothalamus to diabetes insipidus and to pathologically prolonged sleep and also on another topic of perhaps wider interest, namely, the part played by the hypothalamus in the emotions.

Since the experiments have been performed on animals the question may arise as to what we can possibly know about their emotions; and I confess at once that I am not concerned with psychic processes but only with the physical manifestations of emotional excitement. When a cat is confronted with a barking dog, the hair on its back and tail stands erect, its pupils dilate widely and if it is prevented from running away it prepares to fight.

Dilatation of the pupils and erection of hair are only the more obvious of a series of profound changes which take place in the body during intense emotion. There occurs at the same time a constriction of the blood vessels, chiefly of those supplying the abdominal viscera, producing a rise in blood pressure and causing the blood to flow more rapidly through the brain, heart, and skeletal muscles. At the same time there is poured into the blood an increased amount of adrenalin which reduces muscle fatigue and the amount of sugar in the blood is increased to supply the muscles with an abundant source of energy. These changes which occur in the body during rage or fear represent, as Cannon [2] has shown,

[2] Cannon, W. B., "Bodily Changes in Pain, Hunger, Rage and Fear." New York, Appleton, 1929.

a preparation for the intense muscular activity required for combat or flight. Certain functions which are not of importance during the emergency are suppressed. Rage and fear decrease the secretory activity of the stomach and abolish its peristaltic movement.

The functional adjustments which have just been described are all brought about through the intermediation of the sympathetic nervous system which carries nerve impulses from the thoracic and upper lumbar nerves not only to the thoracic and abdominal viscera but also to smooth muscle in other situations such as the walls of the blood vessels, the hair follicles and the interior of the eye. Because this smooth musculature, widely spread through the body, receives its innervation along with the viscera from the sympathetic system it is common to speak of this also as visceral musculature.

In addition to their supply from the sympathetic nervous system the viscera receive nerve fibers from another source, known as the parasympathetic system. Fibers belonging to this system, which exert an influence antagonistic to that mediated through the sympathetic, reach the eye by way of the oculomotor nerve, the thoracic and abdominal viscera through the vagus nerve, and the pelvic viscera along the visceral branches of the sacral nerves. There is a fundamental difference in the behavior of the sympathetic and parasympathetic systems. Situations which excite fear or rage throw the entire sympathetic system into activity at once, stopping the movements of the stomach and intestines, and causing dilatation of the pupils, erection of hair, constriction of the blood vessels with resultant rise in blood pressure and other visceral changes too numerous to mention. Nothing comparable to this massive wide spread discharge occurs in the parasympathetic system. It is not integrated so as to insure the simultaneous activity of its several parts.

It will be shown later that stimulation of the hypothalamus elicits the same reaction patterns as do rage and fear. The hypothalamus works through the closely integrated sympathetic system and produces the wide spread visceral reactions which are characteristic of the major emotions. It is in fact the center responsible for this integration. On the other hand, there is no good evidence that it ever acts on the viscera through the parasympathetic system.

Before proceeding further with a discussion of this subject it might be well to see where the hypothalamus is located and to review briefly the relations which exist between it and the pituitary gland.

In Figure 1 there is illustrated a median section of the cat's brain showing the cavity of the third ventricle, the lateral wall of which is formed in part by the thalamus. Below the level of the thalamus the lateral wall and floor of the third ventricle are formed by the hypothalamus which extends from the posterior border of the optic chiasma backward to include the tuber cine-

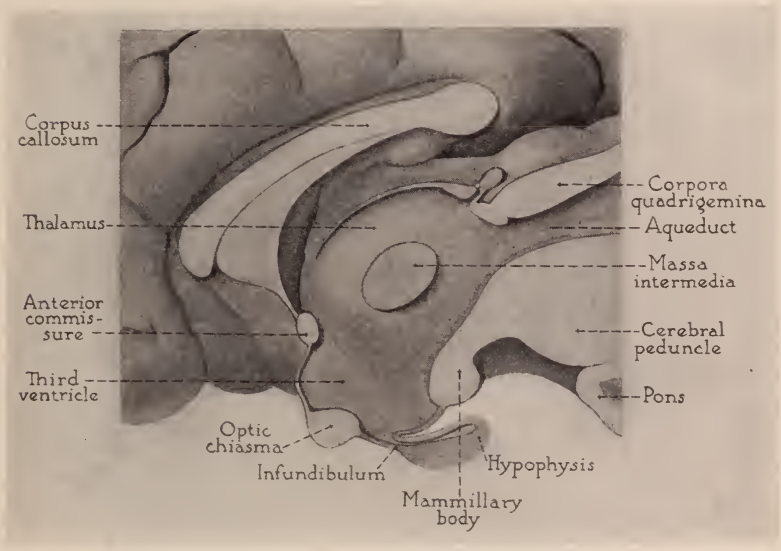

FIG. 1. From median sagittal section through the cat's brain.

reum and the mammillary bodies. From the tuber the infundibulum, containing a tubular prolongation of the third ventricle, extends to the hypophysis. The cavity is continued into the posterior lobe of the hypophysis in the cat.

A view of the cat's brain from below (Fig. 2) shows the hypothalamus bounded in front by the optic chiasma and behind and laterally by the cerebral peduncles. If a transverse section is cut through one lateral half of the brain in the plane indicated by the index line going to the mammillary body in Fig. 1, the structures illustrated in Fig. 3 are disclosed.

The hypothalamus is located at the base of the brain in the floor of the third ventricle and includes the tuber cinereum, which lies immediately behind the optic chiasma, and the mammillary bodies, which lie just behind the tuber. The funnel-shaped infundibulum joins the tuber with the posterior lobe of the hypophysis. Experiments on such relatively inaccessible parts of the brain can best be made with the aid of a special apparatus devised by Horsley and Clarke. The rigid frame of this instrument can be firmly fixed to the animal's head by clamps resting on the lower margins of the orbits and plugs in the external auditory meatuses.

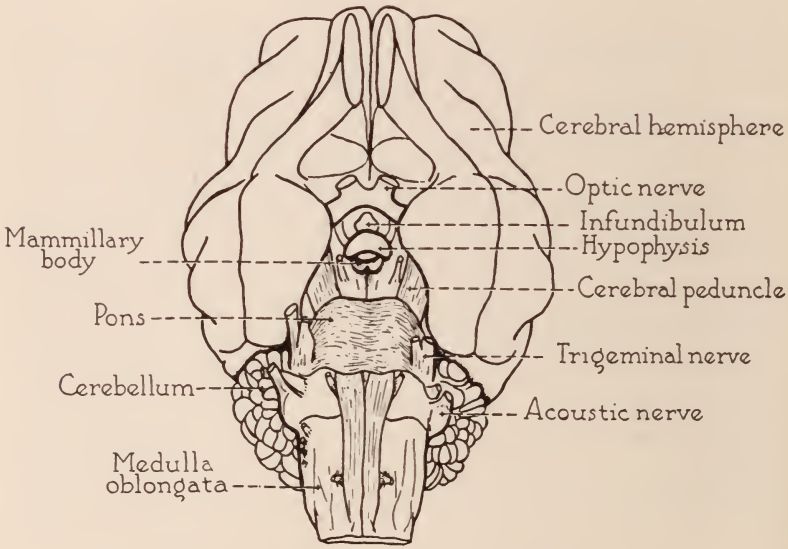

FIG. 2. Ventral surface of a cat's brain.

There are bars graduated in millimeters so arranged that a needle carrier can be brought to any desired point over the brain, and the needle-like electrode then inserted to any desired depth, the position of its point always being accurately known in terms of three rectilinear coordinates with reference to a fixed zero point. For stimulation we use a bipolar needle electrode which is not more than 0.9 mm. in diameter and a faradic current slightly above threshold strength. In cats under light nembutal anaesthesia (18 mg. per kilo) the hypothalamus was explored in the following manner. The electrode was inserted 6 mm. from the

midline in a plane 12 mm. in front of the interaural line and pushed down to a point 3 mm. above the zero horizontal plane. At this point a stimulus was applied. The electrode was then pushed down 1 mm. at a time, with a stimulus at each stop, down to 5 mm. below zero. The needle was then withdrawn and reinserted in the same frontal plane 1 mm. nearer the midline, with

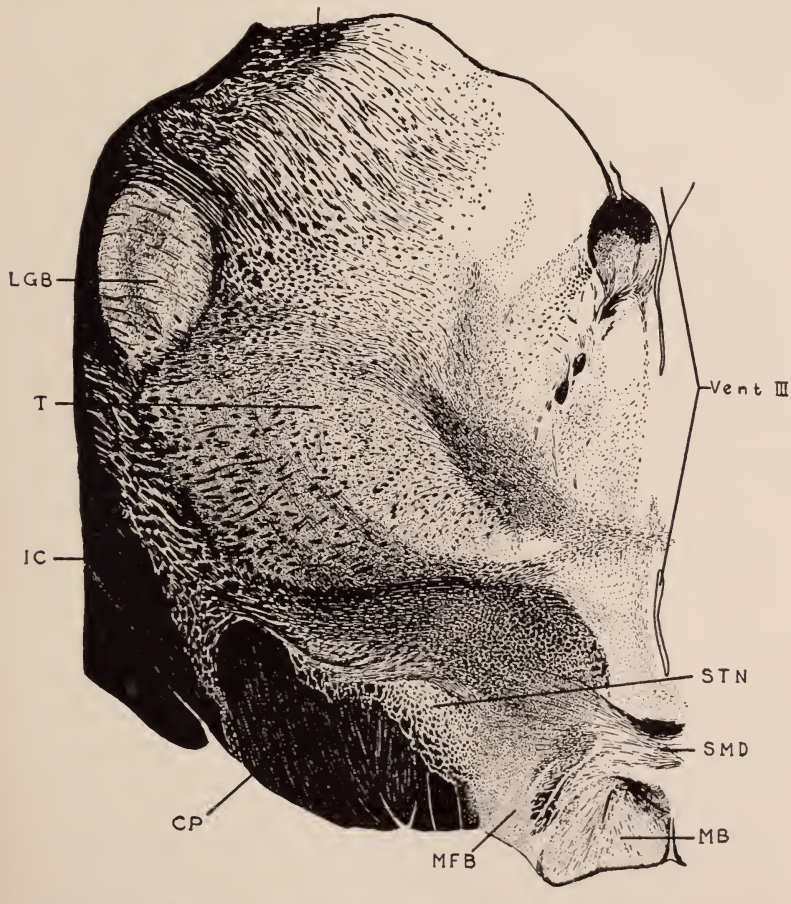

FIG. 3. Transverse section through one lateral half of the cat's thalamus and hypothalamus cut in the plane indicated by the index line pointing to the mammillary body in Fig. 1. Vent III, third ventricle; STN, subthalamic nucleus; SMD, supramammillary decussation; MB, mammillary body; MFB, medial forebrain bundle in the lateral hypothalamic area; CP, cerebral peduncle; IC, internal capsule; T, thalamus; LGB, lateral geniculate body. (Drawing by Dr. W. R. Ingram, reproduced from the *Journal of Comparative Neurology.*)

stimuli at millimeter intervals as it was pushed down. After this frontal plane had been explored millimeter by millimeter to the midline and 1 mm. beyond, the needle carrier was moved 2 mm. farther caudally and another transverse plane stimulated millimeter by millimeter in the same manner. And so on row after row. In the next cat the rows of punctures would be in planes 13, 11, 9, and 7. In this way the hypothalamus and surrounding territory were systematically explored by stimulating in orderly succession every cubic millimeter of their substance. A record was kept giving the coordinates of each point stimulated and the nature of the response. The exact location of each point stimulated was later checked by microscopical study of the brain.

Stimulation of the hypothalamus [3] causes a rise in blood pressure due to the contraction of the smaller arteries and arterioles, acceleration and increased depth of respiration, and increased intravesical tension due to contraction of the bladder, all of which were recorded on the kymograph. These responses are regularly associated with dilatation of the pupils. They are obtained with the greatest ease and regularity. Dilatation of the pupils and constriction of the blood vessels are responses mediated through the sympathetic system, and are regularly associated with increased rate and depth of respiration during hypothalamic stimulation. They also occur in similar association during intense emotional excitement. Contraction of the bladder is a parasympathetic response mediated through the visceral branches of the sacral nerves.

Some seconds after these autonomic and respiratory reactions have made their appearance the excitation caused by continued stimulation of the hypothalamus frequently overflows into somatic motor paths. Running movements and even struggling may occur, but it is perfectly clear that this activity is not responsible for the rise in blood pressure or the increased pressure within the bladder, because the autonomic responses make their appearance first and because they are represented in the kymograph records by smooth curves.

To establish this point beyond dispute the experiments were repeated with curara. Under artificial respiration and while somatic activity was completely abolished by curara, stimulation of

[3] Ranson, S. W., H. Kabat and H. W. Magoun, "Autonomic Reactions Obtained by Electrical Stimulation of the Hypothalamus, Preoptic Region and Septum." *Arch. Neurol. and Psychiat.* In press.

the hypothalamus caused rises in blood pressure and contractions of the bladder which were just as marked as those obtained from the same cats before curara or from other normal cats. These responses, therefore, are not caused by contraction of skeletal muscles but represent true visceral reactions.

While these responses are sometimes obtained from near the ventricular wall, they are more easily and regularly obtained from the lateral part of the hypothalamus in the region occupied by the medial forebrain bundle even up to the edge of the internal capsule. They can also be obtained around the fornix but are not related to either the internal capsule or fornix because they cannot be obtained from these structures excepting where they border on or lie within the hypothalamus. These reactions cannot be obtained from the overlying thalamus. Throughout the anteroposterior length of the hypothalamus these reactions can be obtained best from its lateral part. Posteriorly the reactive field is concentrated in a narrow zone dorsolateral to the mammillary body and across the midline in the supramammillary decussation. From this point the reactive column can be traced back into the mesencephalon. We believe that an important pathway descending from the hypothalamus runs caudalward through this region close to the mammillary body and undergoes a partial crossing in the supramammillary decussation.

Good bladder contractions, associated with a decrease in the rate and depth of respiration and sometimes with a fall in blood pressure, are obtained from the region immediately in front of the hypothalamus, i.e., from the region surrounding the anterior commissure and from the adjacent portion of the septum, but cannot be traced forward beyond this point; and we believe that nuclear masses concerned in this reaction are located here and that a conduction pathway arising here passes back through the hypothalamus in close relation to the hypothalamic sympathetic centers. That is to say, a parasympathetic center for the bladder seems to be located in this region just in front of the hypothalamus.

While rises in blood pressure are never obtained from the region of the anterior commissure and adjacent portion of the septum, drops in blood pressure sometimes are, and they are associated with inhibition of respiration. Occasionally, we have obtained from stimulating this region a good depressor reaction with

a definite slowing of the pulse, indicating an inhibition of the heart through the vagus nerve.

Since stimulation of the region just in front of the hypothalamus causes contraction of the bladder and sometimes a fall in blood pressure and slowing of the pulse, the possibility exists that we may be dealing here with a general parasympathetic center. While this is possible we are still doubtful as to the existence of such a general parasympathetic center comparable to the sympathetic center in the hypothalamus. More evidence needs to be obtained that the vagus can be activated from this region. The only parasympathetic reaction regularly observed was contraction of the bladder, and this seems to have its center farther forward in the brain.

But since our experiments had been conducted under nembutal anaesthesia it was necessary to take into consideration the possibility that parasympathetic reactions might have been suppressed by the anaesthetic. In order to do away with the necessity for an anaesthetic during stimulation, an electrode, which had been placed so that its tip was in the hypothalamus was cemented in position and immovably fixed to the skull. After recovery from the anaesthetic, stimulation in the waking animal produced sympathetic but no parasympathetic responses. If a stimulus which is only slightly above threshold is applied when the animal is lying quietly with the eyes closed, it at once raises its head, opens the eyes and looks around. The pupils are seen to be fully dilated. Respiration becomes rapid and deep, and the hair on the back and tail stands erect. The animal attempts to get on its feet and being restrained struggles violently to free itself, lashing its tail, clawing, and sometimes snarling and biting. After the stimulus has been continued for more than a minute, saliva begins to run from the mouth, and small drops of sweat can be seen on the pads of the feet. All of this disturbance ceases as soon as the stimulus is stopped.

These animals were given barium meals and observed under the fluoroscope.[4] In no case was an augmentation of gastrointestinal peristalsis obtained from stimulation of any part of the hypothalamus. When the animals were resting quietly under the fluoroscope, spontaneous peristalsis was frequently seen in the

[4] Work done in collaboration with H. Kabat, B. J. Anson and H. W. Magoun.

stomach and intestine. This could be stopped instantly by stimulation of the hypothalamus. Peristalsis would not start again as long as the stimulus lasted, and the inhibition persisted for 30 seconds or more after stimulation ceased. Since inhibition of gastrointestinal motility is brought about through the sympathetic system, we were not surprised to find that it occurred whenever the stimulus produced dilatation of the pupil or erection of hair. It is of interest in this connection to note that Cannon has shown that strong emotional excitement stops the movements of the gastrointestinal tract.

Thus by stimulation of the hypothalamus it is possible to produce the physical signs of fear and rage—dilatation of the pupils, increase in blood pressure, erection of hair, cessation of gastrointestinal peristalsis, and increased rate and depth of respiration. After some seconds the excitation spreads to somatic motor centers and causes the animal to lash its tail, claw at the hammock in which it is restrained and struggle violently to free itself. This evidence would seem to show that the hypothalamus is the part of the brain responsible for the elaboration and execution of the complex reaction pattern which is characteristic of intense emotion.

Evidence in support of this interpretation of our observations is furnished by experiments conducted by Bard.[5] He found that cats, from which the cerebral hemispheres and thalamus had been removed, leaving in place only the hypothalamus and the parts of the brain which lie behind it, showed fits of what he called sham rage—sham because the removal of the cerebral cortex had eliminated any possibility of conscious anger. These attacks of sham rage developed spontaneously or could be brought on by the slightest irritation and lasted for a few seconds or for several minutes. They included struggling, clawing, lashing of the tail, a snarling expression, rapid deep respiration and in addition signs of wide-spread sympathetic activity, erection of hair, sweating, increase in blood pressure and heart rate, and sometimes dilatation of the pupil, a picture quite similar to that which we have obtained from stimulation of the hypothalamus. When Bard removed the hypothalamus along with the cerebral hemi-

[5] Bard, P., "A Diencephalic Mechanism for the Expression of Rage, with Special Reference to the Sympathetic Nervous System." *Am. J. Physiol.*, 1928, **84**, p. 490. "On Emotional Expression after Decortication." *Psychol. Rev.*, 1934, **41**, pp. 309 and 424.

spheres and thalamus, leaving intact all of the brain that lies behind it, the cats showed no signs of rage and were incapable of anything closely resembling emotional expression. This shows that the hypothalamus contains an important integrating mechanism capable of initiating the complex visceral and somatic reactions characteristic of rage. It is this mechanism that we have been able to bring into action by electrical stimulation.

Fulton and Ingraham [6] found that if a cut is made from below into a cat's brain in front of the optic chiasma, the cat becomes very irritable and flies into a rage at the slightest provocation. They suggest that this is due to the cutting of tracts coming from the cerebral cortex which normally hold the hypothalamic mechanism under control. Whether this is the true explanation or whether the operation so close to the hypothalamus caused irritation of this part of the brain, must be left open for future research. In any event the importance of the hypothalamus as a part of the neural mechanism involved in emotion seems to be well established.

There are two very different mechanisms by which the hypothalamus exerts its control over visceral functions. The first of these is the one which reacts to electrical stimulation in the manner already described. It includes a descending pathway for the conduction of nerve impulses into the spinal cord, whence they are relayed through the sympathetic system, producing the characteristic visceral responses seen in emotional excitement.

A second channel through which the hypothalamus can exercise its control is furnished by a bundle of nerve fibers running to the hypophysis and known as the hypothalamico-hypophyseal tract. This bundle of nerve fibers and the structures which it joins together—one a part of the brain and the other a ductless gland—form a complex mechanism which has not yet been fully analyzed. But there are good reasons for believing that one part or the other of this hypothalamico-hypophyseal system is concerned in the regulation of metabolic processes such as the utilization by the body of sugar, fat and water. From some part of this dual mechanism there is exerted a profound influence on the sex glands, on the temperature of the body and on sleep. There is a large amount of evidence in support of these statements. The

[6] Fulton, J. F. and F. D. Ingraham, "Emotional Disturbances Following Experimental Lesions of the Base of the Brain (Prechiasmal)." *J. Physiol.*, 1929, **67**, p. xxvii.

chief difficulty lies in determining which part of this dual system is responsible for each of these functions.

The uncertainty as to which functions should be ascribed to the hypophysis and which to the hypothalamus is easily understood in view of the close relationship which exists between these two structures. It is generally believed that hormones formed in the hypophysis make their way directly to the hypothalamus either through the cavity of the infundibulum and third ventricle [7] or by way of the portal-like veins, which according to Popa and Fielding,[8] drain blood from the hypophysis into the hypothalamus. This would indicate that hypophyseal hormones may exert an important influence on hypothalamic functions. A control in reverse direction may be exerted by the hypothalamus on the hypophysis through the bundle of nerve fibers which joins the two structures together. This hypothalamico-hypophyseal tract runs from the supraoptic nucleus backward close to the ventral surface of the tuber and through the infundibulum into the posterior lobe of the hypophysis.

Topographically, the hypophysis with its anterior, intermediate, and posterior lobes lies close to the hypothalamus connected with it by the infundibulum which is surrounded by the pars tuberalis. In experimental work conducted by the usual methods it is difficult to place lesions in one part of this hypothalamico-hypophyseal complex without damaging another. When the tuber is approached by raising the brain it is impossible to avoid traction on the infundibulum, and there is a possibility that damage may be done to the blood and nerve supply of the hypophysis. Tumors in the hypophysis are likely to press on or invade the hypothalamus, and the reverse is also true.

A large tumor in the hypothalamus, recently reported by Davison and Selby,[9] was found on autopsy in a case that had suffered from diabetes insipidus, adiposity, somnolence and subnormal temperature. Although the hypophysis was found to be normal in appearance except for gliosis of the posterior lobe,

[7] Cushing, H. and E. Goetsch, "Concerning the Secretion of the Infundibular Lobe of the Pituitary Body and Its Presence in the Cerebrospinal Fluid." *Am. J. Physiol.*, 1910, 27, p. 60.

[8] Popa, G. and U. Fielding, "The Vascular Link Between the Pituitary and Hypothalamus." *The Lancet*, 1932, 222 (II), p. 238.

[9] Davison, C. and N. E. Selby, "Hypothermia in Hypothalamic Lesions." *Trans. Am. Neur. Assoc.*, 1934.

it would be hazardous to assert that its function had not been affected by the proximity of this large tumor.

In view of the close topographic, nervous and hormonal relations which exist between the two structures, it is not surprising that the greatest confusion exists as to whether certain functions are properly assignable to the hypothalamus or to the hypophysis.

For the solution of such problems experimental work conducted with the Horsley-Clarke instrument offers many advantages. By its use it is possible to make accurately placed, bilaterally symmetrical electrolytic lesions, destroying any desired part of the hypothalamus without damaging the stalk or blood supply of the hypophysis or its pars tuberalis. The lesions can at will be so placed as to interrupt or to leave intact the hypothalamico-hypophyseal tract.

We have been impressed with the small amount of disturbance which large injuries in the hypothalamus may cause if they are properly placed.[10] Cats with large bilaterally symmetrical lesions in the tuber, lateral to or behind the infundibulum, have remained perfectly normal aside from a transient hyperthermia and hyperglycaemia immediately following the operation. They are well nourished and sleek, but show no tendency to excessive adiposity. They mate and raise normal kittens. After the transient hyperthermia, which is not specifically related to the hypothalamus is past, the cats maintain a normal temperature without difficulty.

Diabetes Insipidus

In contrast with the apparently normal condition of the cats. which carried lesions in the tuber lateral to or behind the infundibulum, is the marked disturbance in water metabolism which occurs when the lesions are situated so as to interrupt bilaterally the hypothalamico-hypophyseal tracts.[11] Arising chiefly from the supraoptic nuclei, the fibers of these tracts run backward and medialward along the ventral surface of the tuber to the infundibulum and then along this to the posterior lobe of the hypophysis. From the posterior lobe some of the nerve fibers can be traced into the pars intermedia.

[10] Work done in collaboration with W. R. Ingram, C. Fisher and R. W. Barris.

[11] Fisher, C., W. R. Ingram and S. W. Ranson, "The Relation of the Hypothalamico-Hypophyseal System to Diabetes Insipidus." *Arch. Neurol. and Psychiat.* In press.

Lesions which interrupt these tracts cause a disturbance in water metabolism characterized by excessive thirst and elimination of large amounts of sugar-free urine. These symptoms persist as long as the animal is allowed to live and represent a true diabetes insipidus. In all the cats which developed this disease the lesions were found to have damaged, or completely interrupted, these tracts on both sides of the brain. Associated changes were found in the supraoptic nuclei from which most of these

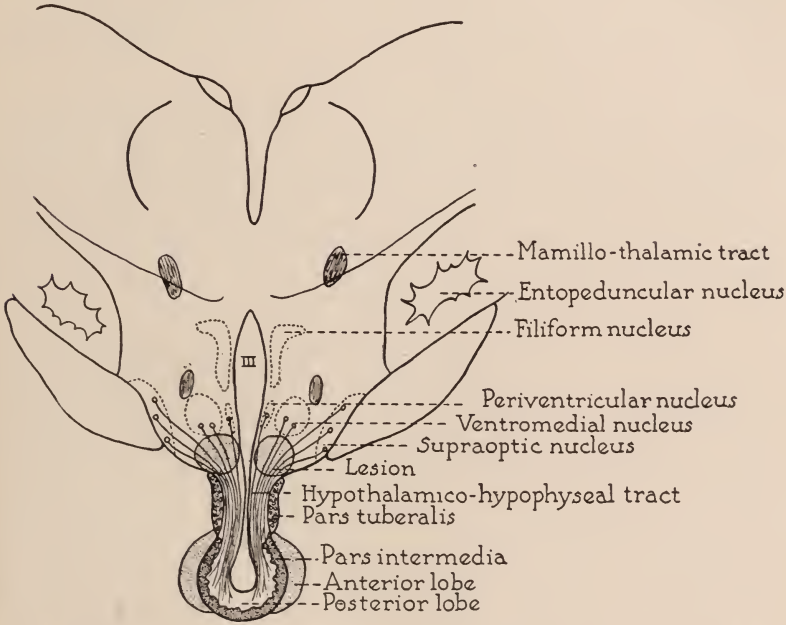

FIG. 4. Diagram of the hypothalamico-hypophyseal tracts showing how they connect hypothalamic nuclei with the posterior lobe of the hypophysis. The bilaterally symmetrical lesions which cause diabetes insipidus are so placed in the tuber cinereum as to interrupt these tracts on both sides of the brain. (Drawing by Dr. R. W. Ingram.)

fibers arise and in the posterior lobe of the hypophysis in which they terminate. In both of these locations atrophy occurred. In order to be effective the lesions in the hypothalamus must be bilaterally symmetrical and reach the ventral surface of the tuber cinereum in front of the infundibulum where they can interrupt the superficially placed hypothalamico-hypophyseal tracts. This results in marked atrophy of the supraoptic nuclei on both sides

of the brain. Usually only a few cells remain in each nucleus. The posterior lobe of the hypophysis is greatly reduced in thickness as compared with the normal, and this atrophy results in an enlargement of the central cavity and of the interglandular cleft. Bilateral interruption of the hypothalamico-hypophyseal tract associated with atrophy of the posterior lobe and supraoptic nucleus was seen in all ten cats with diabetes insipidus which have come to autopsy. More than thirty other cats with microscopically checked lesions in various parts of the tuber showed no disturbance in water metabolism, and in none of these cats was there a bilateral interruption of this tract nor extensive atrophy of the posterior lobe or supraoptic nucleus.

Now that it is possible to produce this disease with ease and regularity in experimental animals it is to be hoped that a study of these animals will reveal why this lesion in the hypothalamus and the resultant atrophy of the posterior lobe of the hypophysis cause such an enormous increase in the water exchange of the body.

Fröhlich's Syndrome

Fröhlich's syndrome, adiposity associated with sexual underdevelopment, was formerly ascribed to hypophyseal insufficiency. Recently the view has become prevalent that the adiposity seen in patients with this disease is due to some disturbance of the hypothalamus. This change of view in regard to the cause of the adiposity was brought about by the work of Smith [12] who found that the anterior and posterior lobes of the hypophysis can be removed from white rats without disturbing fat metabolism, while injection of chromic acid, so as to partly destroy the hypophysis and probably injure the hypothalamus, caused the rats to become excessively fat. It should be emphasized, however, that Smith did not go farther than to suggest that an injury to the hypothalamus was responsible.

In our laboratory detailed records of food consumption and changes in weight have been kept on cats with lesions in various parts of the tuber cinereum.[10] These animals have not gained in weight more rapidly than normal controls. They have not shown an abnormally large appetite and when kept on a standard diet they have shown no special tendency to convert this restricted

[12] Smith, P. E., "Hypophysectomy and Replacement Therapy in the Rat." *Am. J. Anat.*, 1930, **45**, p. 205.

amount of food into fat. Adiposity of the sort seen in Fröhlich's syndrome did not develop in any of these animals. The genital glands from these cats have not yet been examined, but there was no obvious disturbance of sexual functions. Females with large hypothalamic lesions mated, gave birth to full sized litters and nursed and cared for the kittens in a normal manner. Our observations so far as Fröhlich's syndrome is concerned are, therefore, purely negative. They show that large lesions may be placed in the hypothalamus without causing either adiposity or impairment of sexual function.

Somnolence

Somnolence is often seen in patients with tumors involving the hypothalamus. In the epidemic form of sleeping sickness, known as encephalitis lethargica, the gray matter beneath the floor of the third ventricle and in the region of transition between this and the cerebral aqueduct, is extensively damaged. A few cases of pathologically prolonged sleep have been described in which this same region has been destroyed by an abscess (Lucksch [13]) or by a more circumscribed lesion (Pette [14]). From such evidence as this it is known that some part of the brain, situated in this general region, is concerned with the regulation of sleep. Such patients are not comatose. They can be awakened without much difficulty but fall asleep again as soon as they are left undisturbed. In none of these cases has the lesion been very sharply circumscribed, and it has not been possible to determine exactly what must be destroyed to cause somnolence. This is a question which can be studied to best advantage in animal experiments.

In a large number of cats bilateral lesions have been made by Dr. Ingram in the hypothalamus and the adjacent portion of the midbrain with the aid of the Horsley-Clarke apparatus, and in some of these somnolence has resulted.[15] This has been associated with a peculiar plasticity of the body such that the animals would maintain any posture in which it pleased the experimenter to

[13] Lucksch, F., "Über das 'Schlafzentrum.'" *Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1924, **93**, S. 83.

[14] Pette, H., "Die epidemische Encephalitis in ihren Folgezuständen." *Deutsche. Ztschr. f. Nervenheilkunde*, 1923, **76**, S. 1.

[15] Ranson, S. W. and W. R. Ingram, "Catalepsy Caused by Lesions Between the Mammillary Bodies and Third Nerve in the Cat." *Am. J. Physiol.*, 1932, **101**, p. 690.

mold them. When the animals were lying on their backs in a trough, if the limbs were passively extended they remained extended indefinitely. If they were passively flexed they remained flexed. The plasticity also involved the muscles of the neck, trunk and tail, and the cat would lie on its back with the head and pelvis elevated. If then the spine were passively extended it would lie flat in the trough. The cats could be molded into peculiar standing positions with the fore limbs spread wide apart or folded beneath them so as to bring the head to the ground in a caricature of the attitude of prayer. Or they would hang suspended from a stick by their forelegs without making any move to drop to the floor. This somnolence and plasticity is like that seen in the cataleptic type of encephalitis lethargica.

From a study of the brains of these cats and those of others which did not develop catalepsy it has been possible to determine pretty accurately what region must be damaged to produce this syndrome. For this purpose the animals in which the sleep rhythm was not disturbed are fully as instructive as those which were drowsy.

In the first place we have learned that large bilateral lesions in the tuber cinereum in front of the mammillary bodies do not cause catalepsy or any noticeable disturbance of the normal rhythmic alternation of the waking and sleeping states. This statement is based on the observation of the large number of cats used in the study of diabetes insipidus. In this series the locations of the lesions were purposely varied so that in different animals different parts of the tuber were destroyed. Many of these animals seemed to be more docile and less excitable than before the operation but otherwise they were quite normal in their habits and behavior.

It is also clear from observations in another group of cats that extensive damage to the gray matter surrounding the caudal part of the third ventricle and adjacent part of the cerebral aqueduct does not cause catalepsy nor drowsiness if the lesions do not extend far ventrally into the region around the mammillary body. In one animal the destruction extended for a long distance from before backward on each side of the third ventricle and cerebral aqueduct but did not involve the mammillary bodies nor the supramammillary decussation. In spite of the extensive lesions this cat recovered promptly from the anaesthetic. On the day after the

operation it was wide awake and alert and never became lethargic. In another cat, which showed no tendency to somnolence or catalepsy, the gray matter around the posterior end of the third ventricle and the anterior end of the cerebral aqueduct was extensively destroyed. This is in agreement with observations made by Spiegel and Inaba.[16]

It has been shown also that large bilateral lesions situated a short distance behind the mammillary bodies in the red nuclei do not cause somnolence, but, on the contrary, such cats are very restless. This statement is based on the study of a large number of animals with lesions made in this situation for the purpose of investigating the functions of the red nuclei. We first observed catalepsy in connection with this series of experiments when by mistake the lesions extended far enough forward to involve the region of the mammillary bodies. The resulting drowsiness was in such striking contrast to the restlessness commonly seen in cats with lesions in the red nuclei that our interest was at once aroused.

New experiments were undertaken in which the mammillary bodies and territory immediately surrounding them were deliberately damaged.[17] It was found easy to produce catalepsy in this way. Of the forty-eight cataleptic animals thus produced many were killed within a few days after the operation and while still cataleptic. In some the catalepsy and profound somnolence lasted for weeks; others recovered from their lethargy within a few days. While in all forty-eight considerable damage had been done in the region of the mammillary bodies, the damage in this location was more extensive in those which showed a permanent derangement than in those that recovered. In one cat which showed marked and persistent catalepsy and which could be made to pose in odd postures four months after the operation, the region lateral to the mammillary bodies was destroyed and the supramammillary decussation largely degenerated.

It is, therefore, well established that extensive lesions in the region of the mammillary bodies cause catalepsy and somnolence in the cat. That this effect is specifically related to some structure located in this region is shown by the fact that equally extensive lesions situated a little farther forward in the tuber

[16] Spiegel, E. A. and Ch. Inaba, "Zur zentralen Localisation von Störungen des Wachzustandes." *Ztschr. f. d. ges. Exp. Med.*, 1927, **55**, S. 164.

[17] Work done in collaboration with W. R. Ingram.

cinereum, or a little higher up in the central gray matter of the third ventricle and aqueduct, or a little farther back in the red nuclei and surrounding tegmentum, do not produce this syndrome. It will be remembered that the descending pathways from the hypothalamus were found to run close to the dorsolateral side of the mammillary bodies and that there is evidence for a partial crossing of these pathways in the supramammillary decussation. In the cats which showed the most prolonged somnolence these descending paths were seriously damaged or completely destroyed.

In order to study this sleep regulating mechanism in a form more closely related to man, the experiments are being repeated on monkeys. It has been possible to cause profound somnolence in these animals by damage to the hypothalamus.[18]

Following the operation and after recovery from the anaesthetic many of these monkeys were wide awake and very active. But on the day after the operation they gradually became more and more drowsy and finally sank into a deep sleep from which they could be aroused only by considerable prodding. When aroused they would move about in a fairly normal manner. But they would drop off to sleep again as soon as they were left undisturbed. They had a strong grasp reflex and would hang supported from a rod by their arms. Except for this tendency to grasp and hang, these monkeys have not shown the plasticity which is a cardinal feature of catalepsy.

Other monkeys never became very somnolent, but they were drowsy and would occasionally drop into a sleep from which they could be aroused easily. All of these animals, including those which were most severely affected, began to recover from their somnolence after several days.

During the period of somnolence the monkeys were emotionally unreactive. Even after the drowsiness had disappeared and they were again alert, they remained free from fear and allowed themselves to be handled and petted. Their faces were blank and failed to register the play of emotion which is so characteristic of the wild monkey in captivity. In spite of this indifference they were quite intelligent and remembered tricks for getting food which they had learned before the operation. These were wild monkeys recently caught and imported. They had been in the laboratory for several weeks before the operation but had re-

[18] Work done in collaboration with W. R. Ingram and L. J. Pollock.

mained as wild as ever and could be handled only with the greatest difficulty until after lesions had been placed in the hypothalamus. The complete loss of fear after operation and the change from a wild monkey into a pet was a very remarkable transformation. In the course of weeks these monkeys reverted again to their wild state.

The lesions were found to have been placed a millimeter or more too far forward and were in front of the mammillary bodies. Cats with lesions so far forward have not been somnolent although they have been noticeably quiet and docile. A few of the monkeys, which were provided for this particular study,[19] have not yet been used, and in these we shall attempt to place lesions dorsolateral to the mammillary bodies in the same location as those which gave the best results in the cat. When this has been done we may possibly obtain animals which are somnolent for a longer time, and perhaps even a true catalepsy like that seen in the cat.

There can be no doubt that somnolence and a great decrease in emotional excitability can be produced in monkeys by damage to the hypothalamus. Very different was the behavior of another monkey with large lesions a little higher up in the medial part of the thalamus. It did not show drowsiness or any dampening of the emotions. From the time this animal recovered from the anaesthetic until it was sacrificed some weeks later it was as alert and active as a normal animal. It was very excitable and pugnacious and not in any way tamed by the operation.

It is not surprising, in view of the emotional excitement caused by stimulation of the hypothalamus, that its partial destruction should cause a dampening of emotional expression. This occurred to some extent in cats, but the most marked transformation was seen in monkeys, which lost their wildness and even after recovery from somnolence were tame and tractable. This change in behavior appears to have been due to an impairment of the hypothalamic mechanism concerned with the coordination and integration of emotional expression. In favor of this assumption is the fact that larger lesions in the thalamus did not have this quieting effect. But one must not forget that the animals returned again to their wild state, and the lesions certainly did not permanently abolish the capacity for emotional expression.

It is difficult to understand why lesions in the hypothalamus,

[19] Grant from the Ella Sachs Plotz Foundation.

which do not interrupt any of the great sensory pathways to the cerebral cortex, should produce sleep. More information needs to be obtained before an altogether satisfactory reason can be assigned. But we are inclined to look for the explanation in the relation of this part of the brain to emotion. The excitation caused by hypothalamic stimulation in the unanaesthetized animal was found to reach sympathetic and then somatic motor centers producing wide spread activation of both smooth and skeletal musculature. The result was a thoroughly excited animal, just the reverse of the condition which exists in sleep. From the work of Bard we know that the hypothalamus can produce this wide spread excitation after every part of the brain in front of it, including the cerebral hemispheres, has been removed. It is capable of keeping the body in an excited state independently of the cerebral cortex. In view of these facts it does not seem unreasonable to attribute the somnolence seen in our experiments to an impairment of this mechanism and to think of the hypothalamus as playing through its emotional drive an important part in maintaining the waking state. This conception does not exclude the participation of the cerebral cortex in the control of normal sleep, but as Kleitman and Camille [20] have shown, decortication does not abolish an alternating sleep-waking rhythm.

It is significant that the region involved in these somnolent animals has been damaged in patients with pathologically prolonged sleep, and there can be little doubt that these experiments give information which is applicable to man.

In conclusion, it may be said that the activity of the hypothalamus manifests itself in two ways. As a part of the hypothalamico-hypophyseal system it controls the utilization of water and possibly also of fat and sugar in the body. Lesions so placed as to interrupt the tract joining it with the hypophysis cause a large and permanent increase in the water exchange of the body, a true diabetes insipidus. Second, by virtue of its intimate connections with the sympathetic system, it is able to initiate wide spread visceral reactions of the type seen in fear and rage. Its stimulation produces all of the signs of intense emotional excitement, and, when properly placed lesions are made within it, there is a dampening of emotional expression and even somnolence.

[20] Kleitman, N. and N. Camille, "Studies on the Physiology of Sleep; VI. The Behavior of Decorticate Dogs." *Am. J. Physiol.*, 1932, **100**, p. 474.

NOVEMBER 7

STRESSES AND STRAINS OF HOMEOSTASIS. The Mary Scott Newbold Lecture XXXIII. By Walter B. Cannon, M.D. (*Published in Amer. Jour. Med. Sci., 1935,* ***189****, 1.*)

DECEMBER 6

A REVIEW CLINICAL AND PATHOLOGICAL OF PARAHYPOPHYSEAL LESIONS. (Abstract of the Mütter Lecture.) By Charles H. Frazier, M.D., Sc.D.

This, the 47th Mütter Lecture, is concerned with a survey of lesions lying in the suprasellar and parasellar areas, in a region no greater in diameter than half a dollar. Among the lesions considered are: (1) intracranial aneurysms, (2) tumors of the optic chiasm, (3) sphenoidal ridge tumors, (4) pseudotumors, (5) Rathke cleft tumors, (6) hypophyseal stalk tumors, (7) suprasellar fibroblastomata, (8) suprasellar adenomata.

I. *Parasellar Aneurysms.* Among the aneurysms which may be properly considered as parasellar in origin are those arising from the internal carotid, the middle cerebral and the posterior communicating arteries. The incidence of cerebral aneurysms in general is given by Osler [1] as 12 in 800 autopsies, by Pitt [2] as 23 in 900 autopsies; of 154 cerebral aneurysms assembled by Gowers [3] 23 arose from the internal carotid artery, 44 from the middle cerebral, and 8 from the posterior communicating artery. The cause of cerebral aneurysm is varied. Syphilis plays but a very minor rôle, even in young individuals. A congenital weakness of the vessels at the point of bifurcation with a defect in the muscularis appears to be responsible for some cases. Arteriosclerosis is a cause in older individuals. Mycotic aneurysms, while occurring in the vessels at the base of the brain, are more common in the cerebral vessels. Two cases were recorded as illustrations of the diagnostic problems of cerebral aneurysm, one in a young girl of 20, in whom a small aneurysm of the posterior communicating artery ruptured into the inferior horn of the lateral ventricle, and another in a man of 53, with a large aneurysm of the internal carotid artery. In the first case the cause of the aneurysm was a congenital vessel weakness, in the second case, arteriosclerosis.

II. *Tumors of the Optic Nerves and Chiasm.* The diagnosis of these tumors has been largely accidental in the past and it has not been until their exposure at operation that their presence has been suspected. In some instances the clue has been suggested by enlarged optic foramina in the roentgenogram. More recently Balado and Pardal [4] by means of iodized oil injected into the lateral ventricles have found that there is a characteristic appearance of the ventricular system evidenced by a disappearance of that part of the third ventricle corresponding to the infundibulum and optic recess. The histological structure of the chiasmal gliomata is variable. They have been variously reported as neuromata, myxomata, fibromata and gliomata. Verhoeff [5] recognizes (1) a finely reticulated type, (2) a coarsely reticulated type and (3) a spindle cell or coarsely fibrillated type. Gliomata of the oligodendroglioma and glioblastoma multiforme type have been reported in this region. These tumors may involve one or both optic nerves and the chiasm.

When the tumor is small the clinical expression may be represented only by optic atrophy, field defects and loss of visual acuity. With expansion of the tumor there may develop signs of hypophyseal dysfunction with the characteristic alterations in the sella and optic foramina. These tumors occur most frequently in children, as in the case recorded, and the inevitable blindness which would follow a radical removal has placed these lesions in the inoperable class.

III. *Tumors of the Lesser Wing of the Sphenoid.* The most common location for parasellar tumors is the sphenoidal ridge, which is formed by the lesser and greater wings of the sphenoid bone. The most common tumor in this area is the meningeal fibroblastoma, though a glioma from the adjacent temporal lobe may spread over the lesser wing, and rarely an hypophyseal adenoma may come to occupy this region by virtue of its expansion. The great majority, if not all, of the primary tumors of the sphenoidal wing are meningeal fibroblastomata. These are encapsulated tumors attached to the dura overlying the ridge. They may be confined to the sphenoidal ridge, or they may straddle this ridge and extend into the adjacent anterior and middle fossae. The histological structure is quite uniform and is characteristic of meningeal fibroblastomata. By virtue of their position at the side of the sella turcica these tumors may cause a unilateral erosion of the sella; or they may cause an enlargement of the optic

foramen of one side, or destruction of the posterior clinoids and the dorsum sellae. The clinical features of these tumors, as illustrated by a group of tumors, depends on the position and size of the tumor. In small tumors confined to the lesser wing there is unilateral or bilateral optic atrophy, a homonymous hemianopia, possibly oculomotor paralysis of varying degree, and changes in the sella turcica, as described above. In the case of larger tumors there may be in addition loss of smell, unilateral exophthalmos, pain along the first division of the trigeminal nerve and a syndrome of optic atrophy on the side of the tumor, with choked disc on the opposite side. Tumors of the sphenoidal ridge give rise to predominantly unilateral symptoms.

IV. *Suprasellar Pseudotumors.* The term pseudotumor, first suggested by Nonne, has since been variously referred to as "meningitis serosa," "meningitis serosa circumscripta" and "arachnitis" to mention only a few. I have described 22 such cases elsewhere under the title "Cerebral Pseudotumors"[6] four of which suggested an hypophyseal and one a suprasellar lesion. These cases give rise to symptoms involving the chiasm with optic atrophy and with bitemporal constriction of the visual fields, but with no changes in the sella turcica. Operation reveals a thickened arachnoid over the chiasm and optic nerves with accumulation of fluid in the cisterna chiasmatis. Removal of the thickened arachnoid results in a permanent cure. My experience with the surgical treatment of these cases has been most satisfactory. The etiology of the condition is obscure. Infection may be responsible as in one of the illustrative cases in which the ethmoid sinuses were infected, but in most instances infection does not seem to be a factor. In some instances, as in one of my cases, hypophyseal dysfunction may be present.

V. *Tumors of Rathke's Cleft.* In the past, the term "Rathke Pouch Tumor" has been used loosely to designate almost any congenital suprasellar tumor. The term so used is a misnomer. "Rathke pouch tumor" should be replaced by the term "Rathke cleft tumor" and the latter should be confined to tumors or cysts which arise from the remnant of Rathke's cleft, which lies between the anterior and posterior lobes of the hypophysis. Such cysts may be either intrasellar or suprasellar. Their outstanding characteristic is a layer of ciliated columnar epithelium which lines the cyst wall. The cells are tall, vacuolated, and contain several cilia that arise from basal bodies. There may be a transi-

tion into cuboidal and flat unciliated forms, as in a tumor of this type in my series, or in parts of the tumor there may even be a pseudo-squamous type of epithelium. Possibly some of the unciliated suprasellar cysts are really Rathke cleft cysts, the cilia having been lost by pressure of the fluid. Ciliated cells may be found normally in the Rathke cleft in a small percentage of human hypophyses as shown by Rasmussen.[7]

VI. *Hypophyseal Stalk Tumors.* These tumors must be differentiated from the preceding group pathologically. They are epithelial tumors, composed of an epithelial tree, with a basilar layer of cells, a stratum intermedium and a stellate layer. They are often calcified and cystic. While they are heavily encapsulated, they are usually so firmly attached to the base of the brain as to make their removal almost impossible in the vast majority of cases. Their size varies from a small tumor about 1.5 cm. in diameter, to a tumor which may extend, as in one of my cases, from the frontal lobes to the pons, filling the entire base of the brain between the temporal lobes. These tumors arise from cell rests of the hypophyseal stalk. These rests have two common positions; one at the junction of the infundibulum and hypophysis, the other at the junction of the infundibulum and the base of the brain. In the tumors from the lower group of cells the syndrome includes optic atrophy, bitemporal hemianopia, hypophyseal dysfunction and erosion of the sella turcica of greater or lesser degree. Tumors from the upper group of cells grow up into the third ventricle, producing an internal hydrocephalus and choked discs. These tumors, of which I have 16 in my files, have a life history of from 4–10 months, to 1–7 years. Most of my patients were males. Most of the patients are children or adolescents. Nine out of 14 of my cases occurred between the ages of 7 and 17; two were in the third decade, two in the fourth decade, and one in the sixth decade. In terms of percentage, 70 per cent of the stalk tumors occurred under 20 years of age. While bitemporal hemianopia is the usual visual field defect, there may be also, especially if the tumor be prechiasmal, a concentric contraction, or a bitemporal quadrantanopia. In the retrochiasmal group there may be a binasal hemianopia, barrel vision or a homonymous hemianopia. Of the endocrine disturbances the most common findings are arrest of growth and somnolence. In addition there may be a decreased basal metabolism, dwarfism, adipos-

ity, sexual defects, femininity, polyuria and amenorrhea. Generally speaking, the endocrine disturbances are of the Fröhlich type. Neighborhood symptoms are sometimes present and include visual and auditory hallucinations, deafness, tinnitus, vertigo, diplopia and loss of associated movement of the eyeballs. The roentgenogram is important. The sella turcica was moderately enlarged in 4 cases and markedly enlarged in 4 others. Moderate atrophy of the dorsum sellae was present in 6 cases, and marked atrophy was found in 5. Calcification above the sella turcica was present in half the cases. The origin of these tumors is still speculative. Presumably they arise from the remnants of the hypophyseal stalk, although the stalk tumors are lined with an epithelium that differs from that of the original hypophyseal stalk. This investment may be related possibly to the intimate association of the stalk to the oral cavity. The suggestion has been made that they arise from the primitive enamel organ.

VII. *Suprasellar Fibroblastomata.* These tumors arise from the tuberculum sellae. They are solid, hard, slow growing and often compress or encircle the adjacent blood vessels. Microscopically they are characteristic meningeal fibroblastomata. They are attached to the sella at only one or two points and they may be completely removed. Impairment of vision is almost invariably the initial symptom, and the initial signs are usually primary optic atrophy and bitemporal hemianopsia. As these tumors grow they stretch and separate the optic nerves displacing the chiasm upward and backward. If they have attained a large size they may produce neighborhood symptoms such as uncinate attacks, convulsions, hypophyseal dysfunction and hypothalamic damage. These tumors, in contrast to the hypophyseal stalk tumors, occur in adults; primary optic atrophy, a bitemporal hemianopia, a normal or nearly normal sella turcica with no evidence of endocrine dysfunction are the distinguishing features.

VIII. *Suprasellar Adenomata.* The hypophyseal adenoma is almost invariably an intrasellar lesion. Occasionally it may be suprasellar. The growth out of the sella is explained by the difference in structure of the diaphragm of the sella and the variation in the size of the foramen; the escape of the tumor from the sella is easy when the diaphragm has a wide open foramen and a loose structure. The clinical findings are similar to those of the suprasellar fibroblastoma, and the histology is that of the intrasellar adenoma.

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PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY, OCTOBER TO DECEMBER, 1934

(These proceedings will appear in abstract in the Amer. Jour. Ophthalmol. and in the Archives of Ophthalmol.)

October 18

Dr. William Zentmayer: "Memoir of Dr. William Campbell Posey."

Dr. J. B. Rudolphy: "Optic Atrophy Due to Thallium Poisoning." Exhibition of Case. Discussion by Dr. Cooper, Dr. Munch, Dr. Klauder and Dr. Zentmayer.

Dr. H. Maxwell Langdon: "Partial Detachment of the Retina Treated Successfully with the Thermophore." Exhibition of Case. Discussion by: Dr. Holloway, Dr. Hill and Dr. Langdon.

Dr. J. S. Shipman (by invitation): "Malignant Edema of the Lids. (Anthrax)." Report of a Case. Discussion by: Dr. Boon.

Dr. R. H. Peckham (by invitation), *Dr. W. C. Beasley* (by invitation) *and Dr. R. C. Moore* (by invitation): "Binocular Color Mixture in Color Deficient Patients."

Dr. Joseph V. Klauder and Dr. Harold Robertson: "Fever Therapy in Interstitial Keratitis."

November 15

Dr. T. B. Holloway: "Some Cases Illustrating Obstruction of the Retinal Arteries."

Dr. W. G. Mengel (by invitation): "Bilateral Duane Syndrome." Exhibition of Case. Discussion by: Dr. Zentmayer and Dr. Reese.

Dr. Burton Chance: "Sir Jonathan Hutchinson and His Contributions to Ophthalmology." Discussion by: Dr. Daland.

Dr. Judson Daland: "Blindness in Onchocerciasis." Lantern Slides. Discussion by: Dr. D. deRivas and Dr. deSchweinitz.

DECEMBER 20

Dr. T. B. Holloway: "Comments Concerning Obstruction of the Retinal Veins." Discussion by: Dr. Zentmayer and Dr. Langdon.

Dr. D. W. Bronk (by invitation): "The Nerve Messages from Sense Organs."

Dr. Jacob B. Feldman (by invitation): "The Methods of the Management of Concomitant Squint as Carried Out in the Squint Clinic of St. Christopher's Hospital." Lantern Slides.

PROCEEDINGS OF THE SECTION ON OTOLARYNGOLOGY, OCTOBER TO DECEMBER, 1934

October 17

Report of a Case of Osteopetrosis. By Dr. Austin T. Smith.

The patient was admitted to the Jefferson Hospital for treatment of a chronic right maxillary sinusitis. X-ray study of the sinuses revealed an unusual density of the bones of the skull; that of the rest of the skeleton indicated an advanced case of "marble bones."

The present illness began in June 1933 with pain and swelling beneath the right eye, accompanied by high fever. Three or four days after onset an incision was made underneath the right eye and a large amount of pus escaped. Drainage persisted for 10 months and up to admission.

Examination showed a sinus underneath the right eye draining foul-smelling pus. There was considerable pus in the right nasal chamber coming from the right middle meatus. The laboratory studies showed a marked secondary anemia. Operative interference to clear up the infection in the right antrum was not deemed advisable.

The etiology of this condition is unknown. Hereditary influence is considered a strong factor. Symptomatology depends on how far the condition has advanced. Anemia is common, due to encroachment on the medulla of the bones. The bones become chalky and fragile from the excessive calcium.

Discussion: *Dr. Richard Manges Smith:* He showed X-ray plates of Dr. Austin T. Smith's case, calling particular attention to the great density of all the bones, the irregular epiphysial lines and the obliteration of marrow spaces in the long bones. The density was so great as to render the sepsis not distinguishable. The posterior clinoid processes appeared club like.

Dr. Warren B. Davis: He showed X-ray slides of a similar case, which he reported before the College of Surgeons last year. The most notable features in this case were the very apparent cross-striations seen in the bones and the massive extrusion of the mandible.

Dr. Robert J. Hunter: I have seen two cases which might be classed under this same heading. The first case was a man

supposed to have some form of osteoarthrosis. He had repeated fractures and grew perceptibly shorter. One year later I saw a naval man who began to grow shorter after numerous fractures. He had a parathyroid tumor and with gland treatment improved.

Dr. James A. Babbitt: I would like to ask if there is any embryonal explanation for this condition.

Dr. Austin T. Smith: I cannot say whether Dr. Hunter's cases were the same as ours, as diagnosis is only possible by X-ray. Dr. Sternberg found that many of the cases so reported were of other conditions. Answering Dr. Babbitt, it is thought heredity plays an important part. Intermarriage has been associated with this condition. Howard Pirie's account in the Archives of Otolaryngology in 1930, showed that changes were recognized in the fetus in utero and were followed in that individual for several years. The mother of that child was anemic and in generally poor health and had two other children with this condition.

Fibroma of the Nasopharynx with Fatal Termination. Dr. A. A. S. Giordano.

The patient was a man aged 25, who complained of inability to breathe properly through the right side of his nose. The onset was about ten years ago, with symptoms increasing in the last two years.

Examination of the nose showed a growth in the right nasal chamber, filling the whole of the middle portion, corresponding to the area normally represented by the middle turbinate. The tumor was pinkish, smooth and rounded, and felt firm and elastic. Attempts to remove the growth with a stout wire nasal snare were without success. Avulsion was then tried through the nose. This was followed by a sudden severe gush of blood through the nose and mouth, requiring prompt packing. Whenever the piece of gauze close to the tumor was loosened, free bleeding started again, and the anterior pack had to be replaced.

Dr. B. D. Parish, in consultation, advised ligation of the right external carotid artery. This was done but free bleeding recurred; so ligation of the left external carotid artery was done, and the nasal pack was removed without further bleeding. The next day the patient had a sudden convulsive seizure, temperature was elevated, respirations became faint, and he died.

The laboratory reported the section to be a fibroma. Death was attributed to meningitis.

Discussion: *Dr. Benjamin D. Parrish:* I made the post-nasal digital examination and found a hardish mass in the upper outer corner of the

right choana, but the tumor mass extended for the most part into the right nostril. The profuse bleeding was controlled by packs, but recurred whenever the packs were removed; so I suggested ligation of the external carotid on that side. Meningitis was put down as the cause of death because of meningeal symptoms, but I have some doubt as to this being correct.

In another similar case Dr. Dorrance was asked to ligate both external carotids so I was able to work in a bloodless field. Recurrence of the growth occurred in this case some time later, but radium needles, at Dr. Pfahler's suggestion, melted it down successfully and destroyed the nasal septum, but saved the patients life.

Dr. George M. Marshall: I am interested in this case because of a case I had about thirty years ago. A man, twenty years old, had a frog-like face. His nasopharynx was filled with a large tumor mass. It was impossible to reach the growth through the nose. I fortunately had a very strong snare with me, which I was able to get around the growth, and very slowly cut the growth off at its base. When removed, it was about the size of an egg. There was no bleeding. The snare, which I used and show here, was made by an instrument maker from Moscow. It is very strong and made by hand. Very few of them were sold because of the cost. The sequel to my case occurred some time later when I saw the patient while crossing the Delaware bridge. He seemed quite well and happy to be rid of his growth.

Whether the growth in the case reported to-night might have been attached to the base of the skull is of course an open question but if so might account for the development of meningitis.

Dr. Warren B. Davis: I recall one case which showed a fibroma filling the nasopharynx, as well as a growth in the cheek. We thought the greater part of the maxilla should be removed and, when this was done, found the two growths were connected. The patient died within twenty four hours from loss of blood. We had another case at the Jefferson Hospital in the past eight months. This patient was treated with radon gold needles and, when discharged, failed to return. He had twenty seven millicurie units. The patient's mother reported that he was much more comfortable.

Unusual Improvement in Tachycardia Following Tonsillectomy. By Dr. Henry Dintenfass.

B. L., aged 21, the daughter of a physician, developed tachycardia in November 1931. The pulse ranged from 140 to 160. The condition came on three weeks after gestation and had existed for three months. Most of this time was spent in bed. There was no elevation in temperature. The extraction of a suspected upper incisor tooth and the administration of digitalis, quinidine and bromides, associated with complete rest, did not bring about the slightest improvement.

The patient had suffered from repeated attacks of acute follicular tonsillitis. Examination on Feb. 14, 1932, showed the tonsils to be moderate in size, cryptic and somewhat congested. There was a line of dusky redness along the inner borders of both anterior pillars. On the left tonsil several depressed scars could be seen, the results of ineffectual attempts at removal by electro-desiccation a month previously.

On February 15, operation was done with gas and ether anesthesia. The enucleated tonsils proved to be soft and spongy and on cross section exuded a thin secretion. In three hours following the operation, while the patient was scarcely recovered from the anesthetic, an astonishing drop in the pulse rate to 100 was observed. In the evening of the same day the pulse rose to 120, dropping again the next morning to less than 80.

It was evident that the tonsils were the seat of infection. Although it does not seem probable that the improvement from the removal of an infected focus would have been manifest before several days or a week, yet it is within the bounds of possibility.

Discussion: *Dr. James A. Babbitt:* A number of years ago a member of our profession from Chicago nearly confounded us with his pronouncement against tonsillectomy in children. He advocated no tonsillectomy unless the tonsil was greatly diseased or definitely infected.

Dr. Benjamin Parrish: I would like to ask if cultures were taken of the tonsils?

Dr. Henry Dintenfass: No cultures were taken as our belief is that examination for bacteria from tonsil tissue usually results in finding the streptococcus and staphylococcus which are present in every tonsil, while the important organism, the diphtheria bacillus, is rarely found. Dusky redness beneath the anterior pillars, with the history of repeated tonsilar infections, seemed to condemn the tonsils. Her father, a physician, had noticed that the tonsils had diminished in size and, since electro-desiccation had been tried with poor results, he advocated their removal.

Molar Tooth Found in the Antrum. By Dr. Robert J. Hunter.

Agnes D. complained of a foul taste in the mouth, a foul odor in the nose and a fistula from the mouth to the antrum through which she could wash the antrum, which she had been doing as a treatment for over a year.

The history showed that a tooth had been pulled at the age of five and another at the age of twelve, at which latter time she was in the dentist's chair over two hours, following which a dis-

charge into the mouth developed. At the age of twenty she again had an upper left molar pulled, and again the antrum was widely opened. X-ray of the sinuses showed the left frontal and left ethmoids involved, with maxillary sinus normal. X-rays were again taken and showed the left frontal cloudy, the left antrum exceedingly cloudy and an indefinite shadow with increased calcium deposit in the antrum beneath the orbit. I suggested that this was possibly a tooth and advised a Caldwell-Luc operation, on the left side. A dilacerated molar tooth with two roots was removed. The entire tooth was imbedded in granulation tissue at the back part of the internal wall of the sinus just below the orbit.

The question arose whether we might be dealing with an infected dentigerous cyst, with the cyst filling the antrum and opened by accident. Examination of the tooth, however, showed evidence that the tooth had been erupted and had been in use.

The patient shows a complete cure sixteen months after operation. The fistula from the mouth to the antrum was closed with a plastic flap. All discharge and odor have ceased. The frontal sinusitis, indicated in the X-ray by the thickening of the mucous membrane, has given no trouble.

Discussion: *Dr. James A. Babbitt:* Since the tooth found in the sinus was a molar, was there any significance in this?

Dr. Samuel Skillern: I have seen live and healthy teeth in the maxillary sinus and one in a nasal septum. Those in the maxillary sinus were supernumerary, temporary teeth, and the accompanying maxillary sinusitis had nothing to do with the presence of the teeth.

Dr. Robert J. Hunter: The odor in this case was due to infection, and the mucous membrane of the sinus was markedly thickened, showing constant irritation from the presence of the tooth. In dentigerous cysts infection is not usually present. I believe the infection was introduced when the tooth was forced into the sinus and nothing was said about it.

November 21

Osteomyelitis of the Skull and Osteogenetic Processes in Repair of Cranial Defects. Lantern Slide Demonstration. By Dr. Albert C. Furstenberg.

My first case of osteomyelitis of the skull occurred in 1916 and the account to be recited was a real tragedy in surgery. Osteomyelitis attacks bones of the skull and meninges. It produces

wide gaping wounds and horrible deformities. With this picture in mind and the thought that some error of the surgeon has been responsible, the tragedy is complete.

We can think of many cases of this condition, and almost every otolaryngologist has had at least one case in connection with disease of the sinuses. It is a matter of cause and effect and not chance. It is my observation that this condition has for the most part followed the Killian operation and a few intranasal sinus operations. One case resulted after an attempt to enlarge the naso-frontal duct. Another followed the simple intranasal draining of a maxillary sinus, and another followed a Caldwell Luc operation. I have followed twenty-eight cases in all. This serious complication occurs not alone in the hands of those of meagre training and none has offered a reasonable explanation. In analyzing the cases in literature we find inadequate drainage with pus under pressure and pressure with extension to bones of the skull.

The mode of spread of infection to the skull is first by the diploic veins. This was illustrated by lantern slides showing skulls with the outer tables filed off. Spread by continuity is resisted by the compactness and thickness of the bone. This latter method does not account for spread from maxillary sinus and from other distant sources. Spread is usually to the diploic veins, with lodgement of infection in some of the smaller spaces in the inner table, and by inflammatory occlusion of the dural blood supply to these areas followed by destruction of the bone affected. Distant areas are sometimes involved as the result of infection being taken up by the dural veins and distributed elsewhere.

Bone repair was profusely illustrated and shown to begin in isolated areas on the dura and to spread from these rather than by peripheral extension as might be expected from the limits of healthy bone.

Discussion: *Dr. Francis E. Grant:* The question of the dura and its blood supply to the bone is very enlightening. It is a concept of neurosurgeons that much of the blood supply comes from beneath the temporal muscle. In turning back large flaps we do not see blood vessels running to the bone. Dr. Furstenberg's explanation of repair of cranial defects is interesting. I have also seen after large osteoplastic flaps no apparent regeneration, but on reopening have found regenerated bone of an entirely different type, softer and more like cancellous bone.

There is no doubt that we do not attack this condition early enough

or radically enough. In one case, a fulminating affair, three or four days after pansinusitis developed there was involvement of the cranium with extradural abscesses.

When you have a puffy tumor over the frontal sinus you have osteomyelitis. If you find involvement of the pericranium, you are sure of it. Dr. Furstenberg suggests what is important and had not occurred to me—to operate from a healthy to the diseased area.

Another important consideration—we must watch the blood picture. In one case we nearly lost the patient because the hemoglobin declined to 35 per cent.

Dr. George B. Wood: The cases I have seen have all followed acute infection after operation, but I am not sure were the result of operation. I remember one patient who had chronic sinusitis with an acute infection, swelling and edema over the frontal area up to the hair line. He made a perfect recovery after removal of a sequestrum. Interestingly enough in regard to regeneration, in three years there was almost complete closure and regeneration of bone from the periphery. A certain nurse after opening of her sinus and recovery asked one day, "What is this lump on the top of my head?" The whole top of her skull was destroyed and she died of brain abscess. There was no intimation before the lump appeared of any osteomyelitis developing.

Dr. Geo. M. Coates: I have followed Mosier and Judd in this work. Dr. Mosier says there is ten days involvement in advance of the X-ray diagnosis. Because of the fear of osteomyelitis Lynch and his followers operated in frontal sinus cases through the roof of the orbit.

Dr. Samuel R. Skillern: I have seen fifteen cases including those of Dr. Coates and my late brother; of these three have died. Wide extirpation of the disease, drainage into the nose and curettement of soft spots has comprised the treatment. Of these cases 90 per cent have gotten well; therefore I can not agree with Dixon that operation causes osteomyelitis. I do agree that it is wrong to open the acutely inflamed sinus.

Dr. Oscar V. Batson: I have an impression that Dr. Furstenberg did not mention in what proportion of skulls he could demonstrate the diploic veins. It is a queer thing that Dr. Brechet described these veins in 1831 and said they are not present in all skulls. I had a student examine fifty skulls and could not find enough specimens to make a good demonstration. With a large amount of marrow the vessels are usually larger. I follow Gregor Papa in teaching that the dura belongs to the skull and call it the meningo-cranium.

Dr. Geo. M. Coates: I would like to ask Dr. Furstenberg if he can tell us about Dr. Fletcher Woodward's staphylococcus serum which is used in this condition. It is not a vaccine, but gives very severe reactions.

Dr. Furstenberg: I am most grateful for such an excellent discussion of my meagre efforts. I do not believe I can answer

all the questions so will show a few pictures of cases which will themselves answer.

The first series were of a girl seventeen years old who developed osteomyelitis of the skull after the attempt to enlarge the nasofrontal duct during an acute invasion. About two days later she developed involvement of the bone. After fifteen months, regeneration was almost complete, but it started from the centre of the healed area and progressed outward. The second concerned a boy developing osteomyelitis after intra-nasal antrum drainage. This infection involved the frontal bone. The third series showed amazing repair after extensive osteomyelitis of the occipital bone following mastoiditis. No one asked why osteomyelitis occurs so often after sinus disease and so relatively seldom after mastoiditis.

In regard to Dr. Coates' question, about edema occurring ten days in advance of bone involvement, I have seen involvement of the bone without edema. I have talked with Fletcher Woodward about his serum, but have had no experience with it. In my twenty-seven cases I am sure osteomyelitis followed in all but eight operated on.

SECTION ON OTOLARYNGOLOGY OF THE COLLEGE OF PHYSICIANS WITH THE PHILADELPHIA PEDIATRIC SOCIETY

Joint Meeting—December 11

Review of Certain Recent Developments in the Knowledge of Respiratory Infections. By Dr. Joseph Stokes, Jr.

Discussion: *Dr. Warren B. Davis:* It is interesting to follow the change in our viewpoint on the respiratory infections. We thought that the pneumococcus and the streptococcus played the whole rôle. Later we added to this the influence of allergic conditions, and that has broadened our viewpoint. There are many factors in that field we still know too little about. Going back to Rosenau's experiment it seems that what was lacking in the development was this virus. The fact a virus plays a part shows why our vaccines, as we have used them, even of the selective type, have been of benefit in only a little over 50 per cent of the cases.

Dr. Geo. B. Wood: I have been very much interested in Dr. Stokes' survey of the recent work on upper respiratory infections. I want to ask Dr. Stokes, is there or is there to be, as far as he knows, a possibility of immunizing individuals to the viruses?

Dr. James Babbitt: I want to ask Dr. Stokes if he finds in his studies any connection between the information which we get from the University of Minnesota on the handling of colds and the use of codein and these studies which he has reported from these other men?

Dr. Houser: Just one question—that is whether Dr.

Stokes in his survey of the literature on this subject has read anything of work done with the anti-virus of Besredka, which has placed this anti-virus in a more favorable light?

Dr. Thorpe: I would like Dr. Stokes to tell us what in general terms were these changes in environment and diet for the mice he was studying.

Dr. Stokes: I am sorry that I did not mention the question of allergy. It is difficult to inject the virus intravenously on account of such possible reactions. The ferret virus immunizes the ferret, but man is not immunized over a long period of time. Man is able to neutralize the virus, but he can get the disease again. Most of the workers believe that the virulent virus will be obtained from some other route than the nose and throat. As far as Dr. Babbitt's and Dr. Houser's questions are concerned I have understood that there probably is not much basis for the anti-virus of Besredka. As far as Dr. Thorpe's question is concerned, Dr. Webster has been interested in the susceptibility of the mice to different organisms. In a highly susceptible strain of mice he has been able to change to a Steenbock diet and has found he can reduce the mortality from about 85 to 15 per cent. I will ask Dr. Church to tell you about the diet as he knows more about that than I do.

Dr. Church: The Steenbock diet contains cornmeal and is a sort of gun-shot mixture of all the things that have been considered good for small animals.

The Tonsil and Adenoid Problem. The Systemic Influence of Upper Respiratory Infection. By Dr. Geo. M. Coates.

The faucial tonsil consists in the main of a fibrous capsule from which trabeculae pass into the parenchyma of the tonsil. These trabeculae carry blood vessels, nerves and efferent lymphatics, there being no afferent lymphatics. The larger crypts often expand below the orifice, so that retention of large quantities of secretion or debris can take place. The crypts of the lingual tonsil are short and wide, and their openings are funnel shaped. They do not easily harbor debris, as pointed out by Dean. With the growth of the individual the tendency of the adenoid to atrophy is more marked than in the case of the faucial tonsil. The adenoid as a focus is commonly overlooked.

Almost everyone agrees that the healthy tonsil does help in immunity and that, under 6 years of age, it has a protective function. The history of local tonsillar inflammation, acute or chronic, regardless of the organisms present, or repeated attacks of tonsillitis are absolute evidence of tonsillar infection. It may be stated that an absolutely negative report is never possible until

the tonsil has been removed and studied histologically and bacteriologically. The diagnosis of tonsillar sepsis in relation to focal infection requires the most cooperative study. Other foci must be sought, or causes other than infection, and the diagnosis of tonsil infection as the etiological factor in the case must be arrived at by general consultation and consideration of all the evidence.

Discussion: *Dr. J. C. Gittings:* No case should be referred to a laryngologist without a verbal or written request for the examination, outlining the condition of the patient as (1) likely to be due to focal infection and (2) as an operative risk. That tonsillectomy should not be done under 5 or 6 years of age, if it is possible to avoid it, is I am sure a wise dictum. I have never seen new lymphoid nodules along the edge of the posterior pillars develop prior to tonsillectomy. An adenoidectomy without tonsillectomy can often be done with profit to the child under 6 years. Finally, it may be well to warn against operation too soon after an acute infection.

Dr. Houser: It seems to me that there are certain instances where the opinion of the pediatrician is of more value than that of the otolaryngologist. I am thinking particularly of the cases which have recurrent tonsillitis.

Dr. Nicholson: We see a great many children highly under-nourished, who are not worked down by thorough and careful examination and elimination to the possible focus. In all cases of sinusitis with drainage over the tonsils, the tonsils should be removed. They are like a sponge and very easily infected. Very few children do not have recurring cold; and sinus infection is the cause in a large number of cases.

Dr. Stokes: In a study made by Dr. Wilder in a large private school, with over 600 pupils, he investigated the incidence of colds. The most susceptible group, comprising 11 per cent of the school, averaged 18 times as many colds as a larger group, comprising 70 per cent of the school. Of the 11 per cent, I have seen a large number who have had their tonsils and adenoids removed without evidence of benefit.

Dr. Wood: As a matter of prophylaxis, I think the tonsil operation is outrageous. I want the internist and pediatrician to tell me, is this patient suffering from a focal infection, then I can examine his tonsils and make a guess. We examined at the Graduate Hospital some fifty or a hundred tonsils, and the only thing that gave us any indication as to whether subsequent histological examination would prove them diseased was the history of recurrent tonsillitis.

Dr. Geo. M. Coates: I think it was Shay of Memphis who advanced the thought that the tonsils were auto-immunizing agents and that one of the main purposes of the sinuses was to participate in auto-immunization. When the tonsils were removed, half of this mechanism was taken away and the burden was thrown on the sinuses.

PROCEEDINGS OF THE SECTION ON GENERAL MEDICINE, OCTOBER TO DECEMBER, 1934

October 22

Transmission of Syphilis by Blood Transfusion. By Dr. Thomas K. Rathmell and Dr. Harold W. Jones.

Great care must be used during the examination of a blood donor to detect the presence of syphilis. As with fatal transfusion reactions, so here the average physician hesitates to report the transmission of the disease. We set forth from a study of the literature brief reports of 21 instances in which syphilis has been transmitted. To this we add four instances in which the donors were found to be luetic. The disease was transmitted in one instance. The case reports are included.

To prevent the transmission of the disease we suggest that the transfusion problem be directed by a well qualified individual, that blood donors be examined frequently, both physically and serologically. Only in the gravest emergency should blood be given from an untested donor. The laboratory should be available at all times to give at least a Kahn and Kline test report. We feel that all syphilitics, active or inactive, are potential transmitters of the disease.

A Study of Five Hundred Cases of Heart-Block. By Dr. Mary H. Easby (by invitation), Dr. George C. Griffith, and Dr. James E. Talley.

From a survey of over 22,000 electrocardiograms, 500 cases of heart-block were gathered for study. The clinical records were investigated in an effort to determine etiological factors, age of occurrence and the outcome of the cases. The electrocardiograms were studied to determine the type and degree of block in each case.

It was found that out of the total number whose etiology could be determined, about half were infectious in origin (rheumatic or luetic); and the other half were arteriosclerotic or hypertensive. The majority of rheumatic cases occurred before the

age of 50, and were predominantly of the auriculo-ventricular type. The luetic blocks occurred most frequently between the ages of 40 and 60, and were about equally divided between the auriculo-ventricular and intra-ventricular types. The hypertensive and arteriosclerotic group approximately all appeared after the age of 40, and in this group the intra-ventricular type had a higher incidence than the auriculo-ventricular.

Twenty-one cases of Adams-Stokes syndrome were found.

Follow-up data on these cases were incomplete. One hundred and thirty-two cases were known to have died. Of the 116 who were still being seen at regular intervals, 43 were free of marked evidence of congestive heart-failure, while 73 had definite evidence of failure when last examined.

Basal Pulmonary Tuberculosis. By Dr. Burgess Gordon and Dr. Martin J. Sokoloff.

Tuberculous lesions in the base of the lung without upper lobe involvement have heretofore been considered extremely rare, but recent studies reveal that the lesion is probably not as infrequent as formerly believed. In a series of 900 cases of pulmonary tuberculosis, eleven basal lesions were found.

The lesions are more common on the right side, usually unilateral and tend to remain localized. They are apparently relatively benign in character and associated with little toxemia. Excavation may occur early. On X-ray examination two types of lesions are found. There may be an infiltration which resembles pneumonitis and must be differentiated from unresolved pneumonia, bronchiectasis and syphilis. The more common lesion is cavitation. Cavities are usually single and because of their location are often diagnosed as abscess.

Diagnosis is often difficult as, even in the presence of large lesions, tubercle bacilli may be absent from the sputum. For this reason the lesion may be diagnosed as abscess and referred for bronchoscopy. Bacilli may be found in the material obtained through bronchoscopic drainage. Because of unilateral character, surgical treatment is particularly applicable in these lesions. Artificial pneumothorax, sometimes with phrenesectomy, is followed by spectacular improvement.

Because of benign character of the lesion and the favorable response to treatment, prognosis in basal tuberculosis is good. In a series of eleven cases, ten were greatly improved and one died.

THE RELATION OF THE SHAPE OF THE HEART TO THE SHAPE OF THE CHEST, WITH SPECIAL REFERENCE TO THE ANTERO-POSTERIOR DIMENSION AND THE MORPHOLOGY OF VARIOUS NORMAL HEART TYPES. A Contribution to the Question of Accuracy of Ordinary Roentgenological Methods of Heart Measurement. By Dr. H. Roesler.

The antero-posterior dimension of the heart (the depth of the heart) as seen in the lateral view of the roentgen examination was studied in 150 normals; the figures were correlated with certain other heart diameters, as obtained in the anterior view, and with certain chest diameters obtained in both anterior and lateral views. As to certain ratios, there are no differences between adolescents and adults, male and female. The average antero-posterior diameter of the heart is 73.0 per cent of the average transverse diameter of the heart. In studying the range of variation it was found that for 9/10 of all cases the antero-posterior diameter may be from 62.5 per cent to 85.0 per cent of the transverse diameter. The average antero-posterior diameter is 66.3 per cent of the average oblique diameter. As to the range of variation it was found that for 9/10 of all cases the antero-posterior diameter may be from 55.0 per cent to 75.0 per cent of the oblique diameter. There is a close relationship of the body weight to the size of the antero-posterior diameter (as well as to the transverse diameter). Height affects the diameters only if the body weight increases correspondingly. It is demonstrated that certain hearts deviate from the average type in being flatter, broader and longer. Others are deeper, narrower and shorter. Studies of chests from the viewpoint of the width-depth ratio also reveal extreme types; some which are flatter and broader and others which are deeper and narrower than the average.

The intimate relationship between the chest shape and heart shape can be expressed as follows: With the heart flatter, wider and longer than the average goes a flatter chest and vice versa. With the heart deeper, narrower and shorter goes a deeper and narrower chest and vice versa.

The results of the study are supported by anatomical and roentgenologic-volumetric determinations.

When roentgen studies are made in one position only, and this for practical purposes is the anterior view, the following possibilities may occur: (1) Two hearts of different volumes may

give identical or nearly identical linear and area figures. (2) Two hearts of equal or nearly equal volumes may give different linear and area figures.

NOVEMBER 26

THE USE OF INSULIN IN VARIOUS FORMS OF MALNUTRITION, EXCEPTING DIABETES. By Dr. Robert L. Pitfield.

Insulin is known as the endocrine element of the body essential to the assimilation of glucose. In health and in diabetes, it has been employed by the author in the treatment of non-diabetic malnutrition since May 1923. At this time two infants were given three units of insulin per diem. This induced a rapid gain of weight in these athreptic children. Since then it has been used by him in various types of malnutrition in adults which much success. Its action in the non-diabetic is believed to be not different from its action in the diabetic, except that in the latter case insulin is required to prevent pathological loss of glycogen from the muscles of the body, heart and liver.

In the non-diabetic its action is thought to be that of an agent which assimilates the excess glucose, which without it would ordinarily not be retained but be oxidized and pass off as water and CO_2 from the body. The salvaged glucose is directly assimilated and deposited in the body as fat in connective tissues, as glygocen in muscle and in the heart and most probably also in nerve cells. Thus insulin causes in most cases a rapid increase in weight and an increased vigor and turgor, aiding in the cure of nervous cases especially those with visceroptosis. Not only in athreptic infants does it work well and in the under-nourished visceroptopic persons but in cases of tuberculosis. It was related by the writer that in a notable case of myasthenia gravis in a medical student named Hassenberg, invalided for 25 years with this disease, it rapidly effected a cure when other remedies had failed. When buffered with an excess of glucose or other easily soluble carbohydrate insulin causes a steady gain in weight every week. The amount gained in men is 3.4 pounds per week and in women 2.4.

After discontinuing it patients exhibit a blood sugar above normal for a short time and continue to gain in weight. The gains in weight are not alone due to increased hunger nor to water retention but to the direct deposition of the glucose in muscles, and in connective tissues as fat. It acts often in a very satis-

factory manner. It does not appear from animal experiments that there are just grounds for believing that insulin in non-diabetics produces diabetes.

THE NECESSITY FOR PERSONALITY STUDY IN PATIENTS WITH PEPTIC ULCER. By Dr. Edward Weiss.

Attention was called to Cushing's observations concerning erosions and perforations in the upper digestive tract in association with certain cerebellar tumors and to the experimental studies, growing out of these observations, wherein Cushing and others produced acute peptic ulcerations by stimulating tuber centers by various means; and more especially to the hypersecretion, hypermotility and hypertonicity particularly marked in the pyloric segment in such experiments. These are effects commonly associated with chronic peptic ulcer in man. It is likely that acute erosions are the primary stage in ulcer formation; that they are of common occurrence; and should the insult be continuous or repeated it is conceivable that a chronic lesion might result. Mention was made of the observations of Alvarez and others as to the type of individual in whom ulcer is apt to occur and recur, and to Cannon's physiologic experiments on the rôle of the emotions in influencing the workings of the gastro-intestinal tract. A case was cited in which important, easily ascertained emotional factors, seemed to precede the manifestations of ulcer. But the special point is that these powerful emotional factors, having their origin in the unconscious mental life, are, in many cases, not easily apparent and that more profound personality study is often necessary to bring out the conflict which apparently stands in some relation to the precipitating factor in the development of the ulcer.

At this point the question was raised as to whether psychologic stimulations, just because they are unconscious and cannot be discharged in the usual motor activities, may not, through the tuberal centers and vegetative nervous system, affect the workings of the gastro-intestinal tract in a manner similar to the physical experiments of Cushing and others.

A case was cited to bring out these points but time did not permit the development of the idea of just why the particular mental mechanisms discussed should have a specific relationship to dysfunction in that portion of the gastro-intestinal tract.

It was emphasized that these studies are not an attempt at a complete explanation of the etiology of ulcer but simply deal with one set of factors, which in addition to the constitutional peculiarities, acid aggression, etc., as pointed out by Rivers, need to be included in the total conception of ulcer formation. It ought to be apparent, also, that, in the individual case of ulcer, such studies are necessary for more satisfactory understanding and treatment.

The Clinical Application of Duodenal Extract (Macallum-Laughton) in Diabetes Mellitus. By Dr. Garfield G. Duncan.

This study was begun in the fall of 1932. The extract, obtained from cattle, was given orally in doses from ⅛ to 6 gm. three or four times daily.

Lantern slides of illustrative cases depicted: Increasing tolerance as shown by great increases in carbohydrate and total calories without provoking hyperglycemia in diabetics; the controlling effect of the extract on diabetes when large doses of insulin were abruptly withdrawn from severe diabetics; evidences that the extract became most effective only when the diabetes was controlled and the insulin stopped; tolerance curves were improved or made worse by giving or withdrawing the extract respectively.

Respiratory quotients indicated improved glucose utilization. Patients who were helped could tolerate more insulin without insulin reactions than previously.

Of 12 severe diabetics, 8 (4 were children) showed remarkable response to extract therapy while 4 were not helped; of 18 mild cases, 11 were aided and 7 were not.

A small group of severe diabetics with a narrow margin of safety between a hypo- and hyper-glycemia derived no benefit while patients requiring as much or more insulin but with a greater margin of safety responded spectacularly to the extract.

No untoward effects were found. The chief difficulty was in obtaining potent supplies of the extract.

Doses of ¼ gram q.i.d. were effective. The effect lasted from 3 to 8 weeks after withdrawal of the extract. All patients from whom the extract was withdrawn returned eventually to their former insulin requirement.

The investigation suggests that two types of diabetes exist:

(1) from lack of activation of the pancreatic by a duodenal factor and (2) from loss of pancreatic islands.

A tentative hypothesis that a duodenal factor is in relation to the pancreas as iodine is to the thyroid gland is suggested.

CLINICAL OBSERVATIONS ON ONCHOCERCIASIS. By Dr. Judson Daland.

Onchocerciasis is an endemic, progressive disease, with occasional exacerbations and remissions, occurring at all ages and in both sexes, and the duration may be twenty or more years.

The cause of this disease is the Onchocerca caecutiens, and millions are in the skin, but none in the blood.

The sole transmittor is a female *Simulium*, which in a few days develops a microfilaria into a young adult.

The disease occurs among Indians on coffee plantations, and is restricted to an altitude of 1200 to 4200 or more feet, corresponding to the region occupied by the fly.

The estimated number of cases of onchocerciasis is estimated at 50,000 or more and the disease is slowly spreading.

The diagnostic symptoms in the order of importance are: microfilariae; tumors, 97 per cent located upon the head; eosinophilia, averaging 37 per cent; thickening and swelling of the ears, eyelids, and skin of the face; conjunctivitis; mild or intense photophobia; impaired or loss of vision; keratitis; iritis; and choroiditis.

Onchocerciasis frequently co-exists with malaria, dysentery, uncinaria, ascaris, pin and tape worms.

The symptomatology and pathology of onchocerciasis is chiefly due to the presence and movements of the parasite, but in the opinion of the writer, is also in part due to toxins produced by adult worms and the metabolism or death of microfilariae.

Many authors have observed, after excision of tumors, a sudden improvement in photophobia, vision, mental confusion, auditory hallucination, or dysfunction of the iris and also a reduction in the number of microfilariae and eosinophiles. Excision of all tumors is followed by arrest of the disease. Prophylaxis is economically impossible. Treatment by drugs is unsatisfactory.

The microfilariae of a similar disease in N. W. Africa are morphologically identical with those of the American disease.

This communication is based on the study of 50 cases of onchocerciasis in Guatemala.

December 17

The Heterophile Antibody Test in Leucemia and Leucemoid Conditions. By Dr. George L. Weinstein and Dr. Thomas Fitz-Hugh, Jr.

It is the purpose of this study to attempt to confirm the original observation of Bernstein that in leucemia the heterophile antibody titre is uniformly at a low level, and to investigate heterophile antibody formation in leucemia and certain leucemoid conditions before and after the parenteral administration of horse serum.

Conclusions

1. The heterophile antibody titre in the sera of 13 cases of leucemia was found to be uniformly and repeatedly at a low level regardless of the stage and type of the disease. This constant finding may be of value in ruling out the diagnosis of leucemia in any case in which a high heterophile antibody titre is found.

2. A low or normal titre of heterophile antibody was found also in 3 cases of Hodgkin's disease, 5 cases of lymphosarcoma, 4 of polycythemia vera, 3 of agranulocytic angina, and a number of miscellaneous cases including typhoid fever, simple adenitis, syphilis, tuberculosis, anemia, et cetera.

3. A high titre (zone 3) was found in serum sickness and acute infectious mononucleosis—thus confirming the reports of Paul, Bunnell and others.

4. The parenteral administration of horse serum did not produce a rise in the heterophile antibody titre in four cases of chronic lymphatic leucemia. This finding is in accord with previous evidence.

5. A similar failure of increase of heterophile antibody titre following horse serum injections was found in one case of "atypical" Hodgkin's disease and 2 of lymphosarcoma—suggesting the possibility of a biologic relationship of these conditions to lymphatic leucemia.

6. The parenteral administration of horse serum in three cases of chronic myelogenous leucemia produced a marked rise in heterophile antibody titre similar to that occurring in non-leucemic individuals. This finding is not in accord with previous evidence, and suggests the possibility of a real biological differ-

ence between myelogenous leucemia on the one hand and the lymphatic group on the other hand.

THE PATHOLOGIC PHYSIOLOGY OF BURNS. By. Dr. Virgil H. Moon.

All types of simple local injury to the skin are followed by a "triple response" consisting of: local hyperemia due to dilatation of the minute vessels, a spreading flare due to reflex dilatation of neighboring arterioles, and local edema which produces a wheal or a bleb. This reaction is always due to the release of histamine locally by injured cells (Lewis, Dale, Krogh).

The triple response is a physiological mechanism by which injured tissues initiate a local defensive and reparative reaction—inflammation.

A local burn causes the liberation of histamine sufficiently to cause local dilatation and permeability of capillaries; the large amount liberated from extensive burns will produce similar capillary reactions of systemic distribution.

Extensive superficial burns are followed by rapid weak pulse, rapid shallow respiration, progressive decline in blood pressure, subnormal temperature and hemo-concentration. Often the vomitus and excreta are blood tinged. These are the characteristic manifestations of shock arising from diverse causes.

At postmortem there is extreme congestion of the thoracic, abdominal and cranial viscera and marked edema especially of the lungs. Fluid is increased in the serous cavities, and numerous petechiae develop in serous and mucous surfaces. These are the visible tissue changes characteristic of shock.

Moderate degrees of circulatory impairment contribute to the development of secondary pneumonia, the most frequent cause for delayed death following burns.

The essential cause for circulatory failure of this type is loss of capillary tonus. This is accompanied by hemo-concentration, recognizable clinically, and by characteristic tissue changes demonstrable at autopsy.

The "burn toxin" is probably histamine.

AMYLOID NEPHROSIS. By Dr. F. William Sunderman and Dr. D. L. Farley.

A case of amyloid nephrosis, diagnosed two years before death, was presented in which the type of protein excretion in the urine

was investigated. The urine contained large amounts of primary and deutero proteoses, albumin, and traces of peptone. The urine exhibited a behavior with respect to heat which resembled, through the period of one or two coolings and reheatings, Bence-Jones protein.

The Congo-red test in this case was typical for amyloidosis.

THE DIURETIC ACTION OF SODIUM DEHYDROCHOLATE. By Dr. Franklin A. Weigand.

This is a preliminary report upon the use of "decholin-sodium" as a diuretic in oedema accompanying cardiac decompensation and hepatic congestion. Dehydrocholic acid, introduced in Vienna in 1923 by Neubauer, is the least toxic of the bile salts, acts strongly as a cholagogue, a choleretic and in certain cases as a diuretic. The diuretic effect of liver and liver extract has been noted by numerous observers.

Adlersberg (Klin. Wchnschr., May 17, 1934) expounds the rôle of the liver in water metabolism. He states that the liver supervises the in- and out-flow of water in two ways, mechanically and by means of a hormone. Decholin is believed to induce a hyperemia of the liver cells, causing more water to be brought under the supervision of the liver, resulting in diuresis in suitable cases. This action has been reported by Adlersberg, Neubauer and others in Europe, but has no especial consideration in American literature.

Bix and Fleckseder observed an increased diuresis when sodium decholin was combined with salyrgan. All observers advise the use of ammonium chloride orally with these substances.

Six cases from the ward service of Dr. Edward L. Bortz in the Lankenau Hospital and private practice are presented.

In two cases there was no increased urinary output following use of decholin-sodium alone. In one case there was a total output of 11,615 cc. following three injections of sodium decholin compared with a total of 7570 cc. over the same period of time following ½ ampule of novasurol.

Results in the remaining three cases suggest (1) that the best diuresis is obtained when sodium decholin is administered in the same syringe with salyrgan; (2) that the dose of salyrgan can be decreased by combination with sodium decholin. This result is enhanced by oral administration of ammonium chloride.

PROCEEDINGS OF THE SECTION ON MEDICAL HISTORY, OCTOBER TO DECEMBER, 1934

October 8

Recent Discoveries Concerning Prehistoric Man. By Dr. Edward B. Krumbhaar.

The story of prehistoric man was briefly sketched, illustrated by lantern slides, and models were shown of the Pithecanthropus, Eoanthropus, Sinanthropus and the Rhodesian skull. Black's and Pei's recent finds at Chou Kou Tien and Dawson's discoveries at Piltdown were described in more detail.

Dr. Cotten, William Cowper's Psychiatrist. By Dr. Charles W. Burr.

William Cowper was a well educated man of letters but had a miserable life because of his defective nervous system. He had lost his mother very early in life and was sent to a school where many of the larger boys were bullies and often tormented him. This influence was detrimental for the young boy. Later in life he came under the teachings of a neurotic clergyman with unwholesome evangelical tendencies whose influence also proved unfortunate, for Cowper became too concerned for the salvation of his own soul. His life was rendered miserable from fears of damnation inculcated by this preacher, who taught that eternal damnation awaited all who violated the minor details of his moral code. Having in spite of his evident genius a faulty mental make-up, Cowper went insane with a manic-depressive psychosis. He had been poorly cared for medically until Dr. Cotten, a general practitioner living near Cowper, took him into a retreat that he had founded for mental cases. He was kind to Cowper, sympathized with him and encouraged him.

After a stay of two and a half years, Cowper's reason was restored. He celebrated this by writing "The Diverting Tale of John Gilpin," a humorous poem still read by lovers of literature.

Cotten was the forerunner of those benevolent men and women who, seeing the miserable and often cruel treatment accorded the

insane, effected reforms. His influence on Cowper was of the best. Cotten himself was something of a poet and produced a small volume of poems. His son and grandson became useful and distinguished. The grandson effected a social reform in manufacturing circles by insisting that employees should be paid in cash instead of by those orders on public houses which resulted in the mill hands, after getting cash from the publicans, spending it for drink to their great moral and economic detriment.

The world owes much both to Cowper and to the man who set him on his feet and encouraged him.

An Account of the Lives of Two Famous Orthopaedic Surgeons, Dr. Hugh Owen Thomas and Sir Robert Jones. By Dr. Wm. Jackson Merrill.

The aims and accomplishments of Thomas and Jones are intimately comparable, but their valuable contributions to medicine and surgery are distinctly individual.

Thomas, born in 1834, died in 1891, was a son and grandson of unqualified bone-setters. He seems to have been endowed with hereditary skill in the treatment of injuries and deformities. His patients came from a large part of the globe. He employed manual force with a high degree of efficiency and evolved instruments and braces which still bear his name. He advocated rest in the treatment of bone and joint diseases at a time when radical measures were in vogue. He devised many splints and braces to maintain forced and prolonged fixation. Frail in health, through his forceful character he went to the very front ranks in orthopaedic surgery. His interests extended to many other subjects besides medicine. He devoted his life unselfishly to practice, but especially to indigent patients. The poor of Liverpool paid a very significant tribute to him at his death.

Jones, born in 1858, died in 1933, was a nephew of Thomas. He was intellectually and physically adapted for orthopaedic surgery and carried on the principles and aims of Thomas. His chief work was at the Royal Southern Hospital and like Thomas he devoted his special attention to indigent patients. From all parts of the world medical, surgical and other prominent characters came to his clinics and operations. He devised many braces and splints for the treatment of orthopaedic cases. He was President of the Section of Orthopaedic Surgery of the International

Medical Congress, President of the Congress of the International Orthopaedic Society and perpetual President of the British Orthopaedic Association. In the World War he was a very prominent and powerful figure, his vast experience in traumatic surgery making it possible for him to render service to the wounded which no other man could give. With an unusual grasp of the distorsions and deformities which had baffled the medical profession, he devised operations and methods of treatment far above the standards of his time.

His splendid character was brought out especially in his very trying position as Military Orthopaedic Surgeon in the Great War, for in this position he met opposition which few men could have overcome. His sunny disposition, his gentle forceful manner, his encouraging consideration of his associates and his ingenuousness made him an outstanding and unusual character in the medical and social world of his time.

November 12

Reminiscences: the Progress of the Art and Science of Obstetrics during My Professional Life. By Dr. Barton C. Hirst.

Dr. Lionel Wafers, Ship's Surgeon to the Buccaneers. By Dr. Alexander Randall.

December 10

Trephinings of the Skull by Incas. By Dr. Judson Daland.

A Sketch of the History of Color Vision and Color-Blindness. By Dr. Burton Chance.

A brief outline was given of the history of color vision and of color-blindness. After referring to the recorded observations made by the Greeks, the author mentioned that quite as might be expected, the problem of color occupied the versatile active mind of da Vinci and of other painters into modern times.

The observations of Newton were outlined, and the controversies carried on by Goethe, ending in the latter's promulgation of a "theory." The author told of Gladstone's study of Homer's references to the colors observed by the early Greeks who were

in a state of civilization comparable to that of some of the peoples studied in modern times. He called attention to the observations upon the responses made by infants and young children and by animals and insects. He mentioned particular cases of known color-defective persons, presenting the well-known case of Dalton, whose descriptions of himself were so exact and scientific, that from his time onwards valuable, if sometimes perplexing, results have been obtained.

He then listed the various occupations in which perfect color appreciation is demanded and described several methods of testing now in use in the railways, naval, and other public services, as well as in the technical arts. He referred especially to the important publications of Wilson in 1850 and following years, of Holmgren, Thomson, Edridge-Green and of others; and detailed the theories of Young, Helmholtz, Hering, Ladd-Franklin, Donders, and others, which were developed through their studies on color-blind persons.

Some Aspects of Child Welfare in Philadelphia, as Taught One Hundred Years Ago. By Dr. Norman MacNeill.

NECROLOGICAL LIST

Fellows

DR. RUSSELL H. JOHNSON	January	29, 1934
DR. PETER N. K. SCHENCK	February	17, 1934
DR. LEWIS H. ADLER	March	5, 1934
DR. JAY F. SCHAMBERG	March	30, 1934
DR. J. HILAND DEWEY	April	1, 1934
DR. WILLIAM H. WELCH (Honorary)	April	30, 1934
DR. HARRY S. CARMANY	July	14, 1934
DR. JOHN B. CARNETT	July	29, 1934
DR. THEODORE WEISENBURG	August	3, 1934
DR. JAY C. KNIPE	September	3, 1934
DR. WM. CAMPBELL POSEY	September	5, 1934
DR. JOHN A. BOGER	October	21, 1934
DR. JAMES C. WILSON	October	28, 1934
DR. HOWARD F. HANSELL	November	5, 1934
DR. E. BALDWIN GLEASON	November	30, 1934
DR. A. F. KEMPTON	December	6, 1934
DR. G. MORLEY MARSHALL	January	8, 1935

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Home of the College of Physicians of Philadelphia.

AN ACCOUNT

OF THE

COLLEGE OF PHYSICIANS

OF

PHILADELPHIA

A SECOND EDITION

REVISED BY

G. E. DE SCHWEINITZ, A.M., M.D., D.Sc., LL.D.
Senior Censor of the College and formerly President

AND

W. B. McDANIEL 2D, PH.D.
Librarian of the College

IN COMMEMORATION OF THE TWENTY-FIFTH ANNIVERSARY
OF THE COLLEGE'S INSTALLATION IN ITS PRESENT HOME

TRANSACTIONS OF THE COLLEGE OF PHYSICIANS
FOURTH SERIES, VOLUME II, SUPPLEMENT No. 1
DECEMBER, 1934

LANCASTER PRESS, INC., LANCASTER, PA.

PREFACE

Following a suggestion advanced by President Alfred Stengel, an account of our institution written and published twenty-two years ago, while the author was President of the College, has been enlarged, revised, and brought up to date.

Three publications have appeared of a somewhat similar nature. Much more elaborate, they are admirable in their historical accuracy and fine diction, namely:

"An Account of the Institution of the College of Physicians," by W. S. W. Ruschenberger, *Transactions of the College of Physicians*, Centennial Volume, 1887, pp. 1–304.

"Centennial Anniversary of the Institution of the College of Physicians." Commemorative Address by S. Weir Mitchell, President of the College, Centennial Volume, 1887, pp. 305–334.

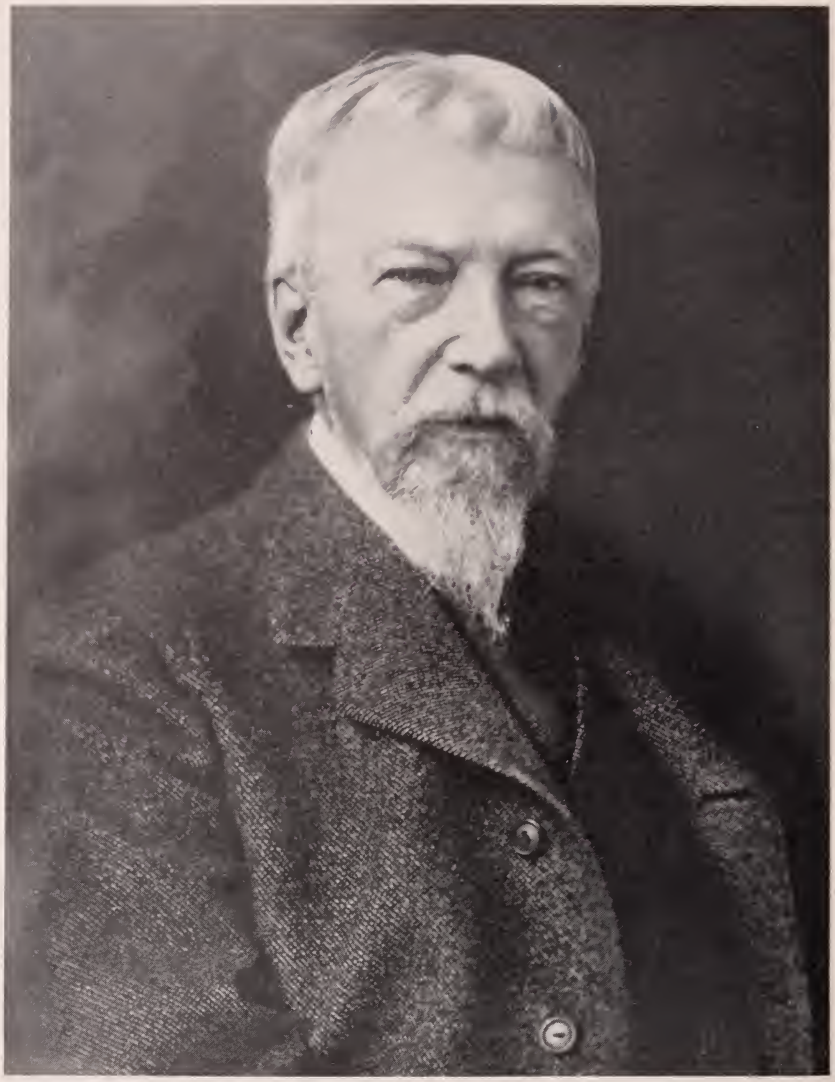
"The College of Physicians," by J. Norman Henry, *Founders' Week Memorial Volume*, Philadelphia, 1908, pp. 124–152.

These publications were frequently consulted and often quoted with due credit in the first edition of this brochure. Their valuable contents have again been studied and utilized.

Mr. Charles Perry Fisher, the former Librarian and Superintendent of the College, who retired in 1932 after a devoted and distinguished service of fifty years, was most helpful in gathering information for the first edition; his printed papers in the Library (see Bibliography, no. 13) have again been consulted with satisfaction during the preparation of this second edition.

The authors further desire to express their indebtedness for help to Dr. Francis R. Packard, a former President of the College, Dr. Edward B. Krumbhaar, Chairman of the Library Committee, Dr. Herbert Fox, Chairman of the Mütter Museum Committee, Dr. John H. Girvin, now a member of Council and for years the highly efficient Secretary of the College, and to Dr. J. Harold Austin, Chairman of the Committee on Publication. They have made many valuable suggestions and exhibited an encouraging interest in the revision.

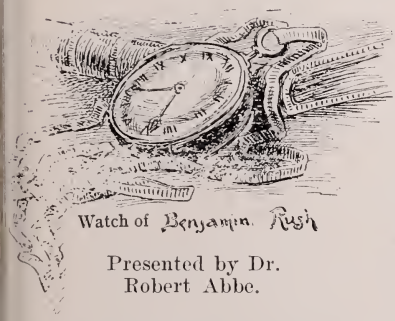
We express the hope that this revised account of the College may interest the Fellows and the friends of our institution.



S. Weir Mitchell,
President of the College, 1886–1889, 1892–1895.

AN ACCOUNT OF
THE COLLEGE OF PHYSICIANS
OF PHILADELPHIA

THE ORIGIN OF THE COLLEGE OF PHYSICIANS



Presented by Dr. Robert Abbe.

The prototype of the College was the Royal College of Physicians of London, but to whose initiative its foundation is due is not definitely known. Doubtless to more than one man this credit belongs. The group of founders commemorated on the walls of the College comprises the following: John Redman, John Jones, John Morgan, William Shippen, Jr., Adam Kuhn, Benjamin Rush, Gerardus Clarkson, Samuel Duffield, Thomas Parke, James Hutchinson, George Glentworth, Abram Chovet, Andrew Ross, William W. Smith, James Hall, William Clarkson, William Currie, Benjamin Say, Samuel Powel Griffitts, Benjamin Duffield, John Morris, John Carson, John Foulke, Robert Harris.

As early as 1767 John Morgan made proposals to Thomas Penn for the erection of a College of Physicians. These proposals, however, failed to meet with favorable reception and a charter was refused. A number of Philadelphia physicians, who subsequently became Fellows of the College, went, after their graduation from the Medical School of the College of Philadelphia (later the University of Pennsylvania), to Edinburgh for the completion of their studies. It is not unlikely that the success of the medical activities in that city stimulated them, as S. Weir Mitchell suggested, to imitate them here. Moreover, these physicians naturally formed friendships with influential men in Scotland and England, and doubtless, in the correspondence which subsequently was carried on between them, the foundation of a College of Physicians was frequently broached. Indeed, Samuel Powel Griffitts,

Drawings by Erwin F. Faber. Photographs by Joseph N. Pearce and Albert R. Apgar.

writing in 1783, expressly states that the idea of an American College of Physicians had several times occurred to him. Dr. W. S. W. Ruschenberger's researches (3) indicate that the College of Physicians was not actually instituted until September, 1786, the first election of officers having been held in October of the same year. But the first meeting after its full organization, at which nine senior and four junior Fellows were present, did not take place until January 2, 1787, and this day, therefore, by common consent, is regarded as its official birthday.

John Redman,
First President, 1786–1805.

The minutes of this meeting record that the officers of the College were: President, John Redman; Vice-President, John Jones; Treasurer, Gerardus Clarkson; Secretary, James Hutchinson; Censors, William Shippen, Jr., Benjamin Rush, John Morgan, and Adam Kuhn. "A fair copy" of the constitution was signed by the members present, and the publication of this constitution in the *Pennsylvania Packet and Daily Advertiser*, February 1, 1787, was authorized. One month later, at the stated meeting of the College, the Secretary reported that the constitution had been published as directed. A device for a seal was submitted and, slightly modified, was adopted so as to read *non sibi sed toti*. The seal was ordered to be cut with this legend: "Sigill: Colleg: Medicor: Philadel: Instituti: A.D. 1787."[1]

Objects and Composition of the College

The Constitution of the College of Physicians thus signed, sealed, and published, records that "the objects of this College are, to advance the Science of Medicine, and thereby to lessen Human Misery, by investigating the diseases and remedies which

[1] This is the form given in the first minute-book, under the date February 6, 1787. The word *sigillum* does not seem ever to have actually appeared on the seal, however, and the legend used to-day reads: Coll. Med. Philad. Instit. A.D. MDCCLXXXVII.

are peculiar to our Country, by observing the effects of different seasons, climates, and situations upon the Human body, by recording the changes that are produced in diseases by the progress of Agriculture, Arts, Population, and Manners, by searching for Medicines in our Woods, Waters, and the bowels of the Earth, by enlarging our avenues to knowledge from the discoveries and publications of foreign Countries; by appointing stated times for Literary intercourse and communications, and by cultivating order and uniformity in the practice of Physick."

WILLIAM SHIPPEN, JR.,
President from 1805 until 1808.

This document further directs that the College shall consist of twelve senior Fellows and an indefinite number of junior and associate Fellows; the senior and junior Fellows to be chosen from physicians who resided "in the City or District of Southwark or Liberties of Philadelphia," and the associates to be selected from "such persons of merit in the profession of medicine" who did not live within these described limits, "without any regard to Diversity of Nation or Religion." The senior Fellowship of the College was maintained by the elevation of juniors within one month after a vacancy was declared. Thus the juniors, in the language of Frederick P. Henry, formed a waiting list, and while they waited doubtless the Censors, of whom there were four, as there are now, made sure that there had been no transgression "of good moral character and decent deportment," which Rule 4 prescribed as a *sine qua non* of eligibility. This distinction between senior and junior Fellows was not long maintained, and the amended form of Constitution adopted November 6, 1787, directs that "the College shall consist of Fellows and Associates." This amended Constitution has been signed by every Fellow of the College since its adoption on the date named. The College has recognized the position of women in medicine by electing Dr. Catharine Mac-

farlane for membership, in 1931, and Dr. Martha Tracy, Dean of the Woman's Medical College, in 1934.

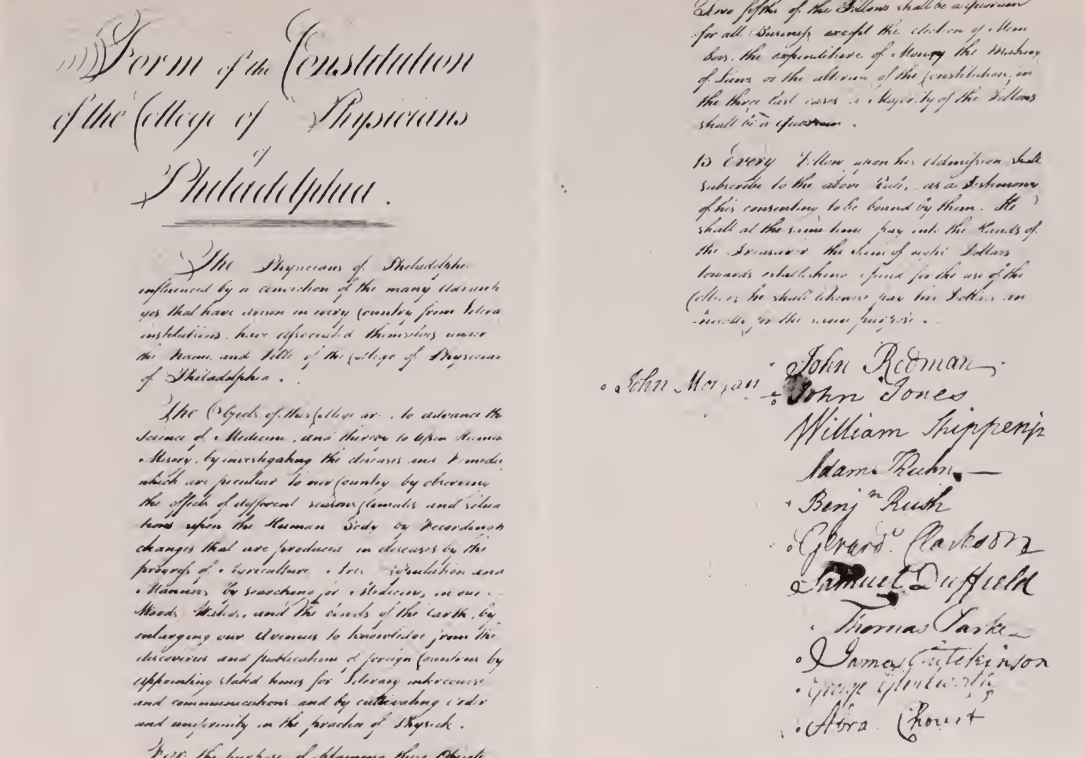
Two years after the foundation of the College, Richard Peters signed, by order of the House of Representatives of the Freemen of the Commonwealth of Pennsylvania, An Act for the Incorporation of the College of Physicians, which declares that "the members of the said College of Physicians be, and shall be, a body corporate and politic in deed and in name, by the name and style of 'THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.'" In Philadelphia, on Thursday, the twenty-sixth of March, 1789, this charter was enacted into a law.

ADAM KUHN,
President from 1808 until 1818.

The name College was chosen with the understanding that it should have the same significance it had in Roman law: a number of persons associated together by possession of common functions, *i.e.*, a *collegium* or body of colleagues. Benjamin Rush, in the first paper which he read before this collegiate body on February 6, 1787, said: "By assuming the name of a College, we shall first be able to introduce order and dignity into the practice of physic, by establishing incentives and rewards for character. Men are generally anxious to preserve the good opinion of those with whom they are obliged to associate. The reception we shall meet with from each other in our meetings will serve to correct or to improve our conduct. And if we are as chaste as we should be, in the admission of members, a fellowship in our college will become in time not only the sign of ability, but an introduction to business and reputation in physic" (2).

THE ACTIVITIES OF THE COLLEGE

The College never has been a teaching institution in the ordinary sense of that term, nor has it the power to confer degrees. It has the right only to bestow Fellowship and Honorary Fellow-



Form of the Constitution of the College of Physicians of Philadelphia.

The Physicians of Philadelphia influenced by a conviction of the many advantages that have arisen in every country from literary institutions, have associated themselves under the Name and Title of the College of Physicians of Philadelphia.

The Objects of this College are, to advance the Science of Medicine, and thereby to lessen Human Misery, by investigating the diseases and remedies which are peculiar to our country by observing the effects of different seasons, climates and situations upon the Human Body by recording the changes that are produced in diseases by the progress of Agriculture, Arts, Population and Manners, by searching for Medicine in our Woods, Wilds, and the bowels of the Earth, by enlarging our Avenues to knowledge from the discoveries and publications of foreign countries by appointing stated times for literary intercourse and communications and by cultivating order and uniformity in the practice of Physick.

For the purpose of obtaining these Objects

Two fifths of the Fellows shall be a quorum for all Business except the election of Members, the expenditure of Money, the Making of Laws or the altering of the Constitution, in the three last cases a Majority of the Fellows shall be a quorum.

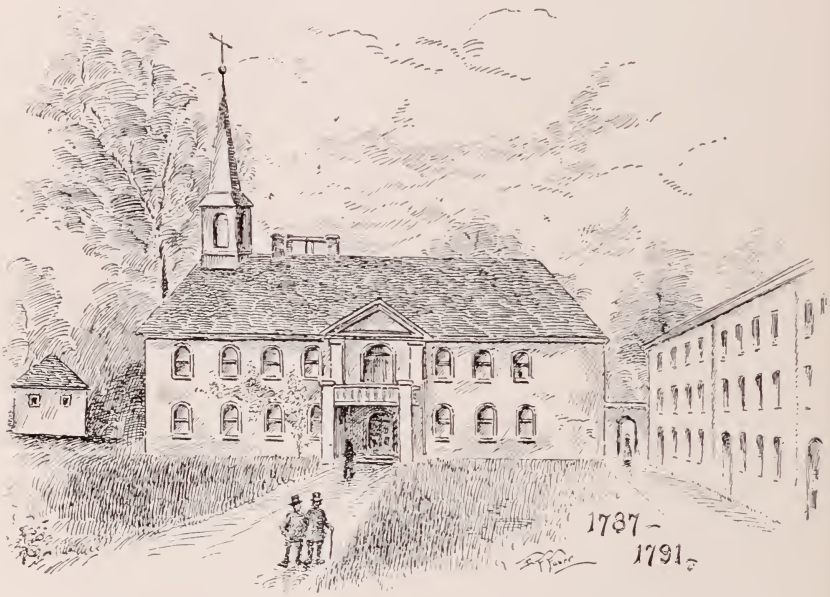
To Every Fellow upon his Admission shall subscribe to the above Rule, as a Testimony of his consenting to be bound by them. He shall at the same time pay into the Hands of the Treasurer the sum of eight Dollars towards establishing a fund for the use of the College; he shall likewise pay two Dollars annually for the same purpose.

John Morgan
John Redman
John Jones
William Shippenjr
Adam Kuhn
Benjn Rush
Gerard Clarkson
Samuel Duffield
Thomas Parke
James Gutekinson
George Glentworth
Abra Chovet

A Portion (Beginning and End) of the Original Constitution of the College of Physicians of Philadelphia, with Signatures of the Original Signers.

ship (originally called Associate Fellowship) upon those who are eligible for these honors; it does not now elect, as for some years it did, a limited number of Corresponding Members. This Collegium, therefore, is a scientific body, dedicated to the reception and discussion of papers on medical, surgical, and allied subjects. These communications are published in the *Transactions,* the first volume of which appeared in July, 1793.

Between November, 1841, and January, 1850, three volumes



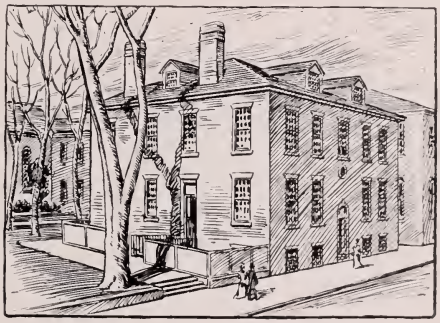
First Home of the College of Physicians in the Old College of the University of Pennsylvania.

of summaries of the transactions were issued, and in November of the latter year a new series of summaries was begun, and continued until July, 1857. Then an arrangement was made with the *American Journal of the Medical Sciences* by which papers read before the College were published in that journal and separate copies were supplied for the use of the Fellows. This arrangement continued in force until November, 1874. The first volume of the Third Series of the *Transactions* was issued in 1875, and the eighth in 1886. Each year since that date a volume of *Transactions* has been printed. In 1933 a Fourth Series of the

Transactions was instituted, the annual volume now appearing in two or more parts.

The first meetings of the College were held in the old Academy at Fourth and Arch Streets in the afternoon of the first Tuesday in each month. Now the meetings take place on the first Wednesday of each month, June, July, August, and September excepted, at eight-thirty in the evening.

The gatherings of the Fellows of the College have not always been concerned alone with the discussion of scientific matters, but, in the language of Dr. James Tyson, "The College early assumed a guardianship over the health, safety, and even the morals of the community." The first standing committee, that on Meteorology and Epidemics, was appointed March 6, 1787, and it presented a yearly report until it was abolished in November, 1882, a period of ninety-five years. In 1913 the ninth standing committee was instituted, that on Public Health and Preventive Medicine, as a result of a special paper entitled "The College of Physicians and Public Health" read before the College by Dr. James M. Anders, who was elected the first Chairman of the Committee.



Hall of the Philosophical Society, Second Home of the College, 1791–1845.

From 1793 until 1798 yellow fever prevailed in Philadelphia. Indeed, from 1793 until 1806 no year was entirely free from its baleful influence. During this period the Fellows of the College were active in their labors, giving freely of their service in attendance on the sick and suffering, and of their time in frequent conferences among themselves that they might, working in conjunction with the city and state authorities, devise means and ways for checking the progress of the epidemics. Unfortunately, these conferences were far from harmonious, some of the Fellows believing that the disease was of local origin and others that it had been imported, and each faction maintained its opinion in vigorous and often acrimonious debate. In fact at one time the dissension ran so high that Benjamin Rush resigned his Fellowship, an action in which he was promptly fol-

lowed by several of his adherents in the College. It is due to Rush's resignation, incidentally, that the roll of the College never came to include the name of his staunch friend and admirer, Philip Syng Physick. So, too, differences of opinion arose between the Fellows and the members of the Board of Health, especially as to the etiology of the disease, the pathway of contagion, the value of public notification, and the need of quarantine. In spite of these disturbing elements, much good was accomplished, and all of the Fellows of the College, no matter what their individual opinions may have been, were untiringly brave in the performance of their duties. To quote Weir Mitchell, "No Fellow shirked his duty albeit fear was in the air." Two founders of the College, James Hutchinson, its first Secretary, and John Morris, one of the class of junior members, died of the disease, and others were seriously ill. Even as late as 1820, when yellow fever for the last time visited Philadelphia, the College through its committees urged the view which it had adopted originally, namely, that the disease was imported and that it spread by contagion.

Mercantile Library,
Third Home of the College, 1845–1852.

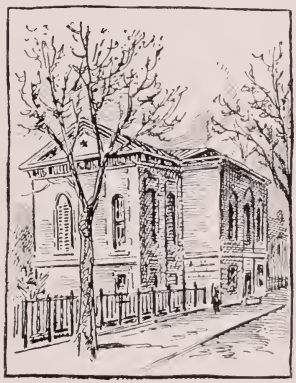
In December, 1802, Lettsom sent to the College a supply of vaccine virus. He was elected an Associate Fellow. But Jenner, proposed by Plunket Glentworth, failed of election—"a sad commentary," says Alfred Stillé, "on the too conservative tendencies."

During the earlier years of its existence the activities of the College pertaining to the maintenance of public health and the improvement of public morals were noteworthy. For example, its appointment in 1787 of a committee to submit plans for establishing cold and hot baths and a botanical garden for the city; its consultation with the State Legislature over the spread of infectious diseases in 1789; its consideration in 1794 of "the regulation of the practice of physic within the State," and of the establishment of a quarantine and a hospital for contagious diseases at the request of the various authorities concerned; its work in con-

junction with the Board of Health of the city in the management of the epidemic of cholera in 1788; its memorialization of the State Legislature in 1787 and of the Congress of the United States in 1790 on the deleterious effect of alcohol on the human system and the need of laws regulating its consumption; and its important actions in relation to the preparation of the Pharmacopoeia of the United States, begun in 1788. In each decennial revision of this work the College has taken an active part.

Always ready to maintain proper regulation of animal experimentation, the College has been insistent that experiments upon living animals are an absolute necessity in scientific work. In this respect, especially since 1885, when the College first sent a remonstrance to the Legislature against a bill to prevent such experiments, it has proved to be a veritable research-defense society, with the sole object in view, as Sir William Osler would have said, of keeping the field clear for the free advance of science in the interests of our fellow-creatures.

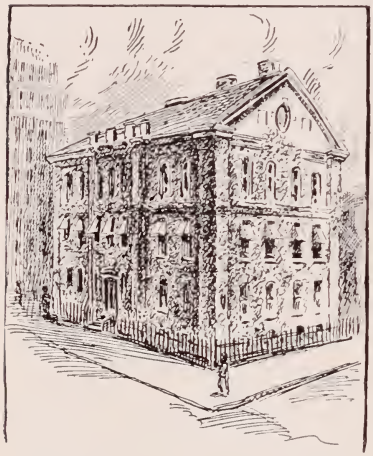
Space does not permit an elaboration of the important work which the College has performed in its efforts to prevent pollution of the water supply of the city, in its insistence upon the registration of births and deaths, in its urging the passage of laws for the inspection of drugs, in its aid in early days in the regeneration of the Board of Health of this city, in its protest in 1855 to the Legislature against a bill the effect of which would have been to put the educational interests of the profession into the hands of politicians, and in its labors to stimulate the enactment of laws to lessen the dangers of dispensing poisonous medicines.



Picture House of the Pennsylvania Hospital, Fourth Home of the College, 1852–1863.

Although in recent years the College in its deliberations has confined itself in largest measure to the discussion of scientific matters, and has shown less inclination than in former times to take an active official part in public affairs, doubtless due, as Dr. Frederick P. Henry has pointed out, to the rise in influence in these particulars of the county and

state medical societies (and it was largely influential in 1848 in aiding the formation of the Medical Society of Pennsylvania), it has by no means entirely disregarded them, and from time to time is consulted in these respects. It has been active, for example, in discussions relating to the registration and reporting of pulmonary tuberculosis, in measures for the regulation of infectious diseases, and in paying strict attention to quarantine laws. For a number of years it maintained a representative on the State Quarantine Board who presented a triennial report.



The Home of the College at Thirteenth and Locust Streets, 1863–1909.

The College at present is, as it was in the past, always ready to be consulted and to give advice in matters pertaining to the welfare of the community. A good example of this is the careful investigation made by a committee appointed by the President of the College, with the authority of its Council, at the request of the Commissioner of Health of the Commonwealth of Pennsylvania, to consider the propriety of the free distribution by the various county societies of antitetanic serum.

War Service

The Fellows of the College did not fail to answer the call of duty in war as well as in pestilence. Of their activities during the War of 1812, we have no record. But in the Civil War many Fellows served with fidelity and distinction. The observation of Weir Mitchell, in association with George R. Moorehouse and with W. W. Keen (who became a Fellow at a later period) at Turner Lane Hospital, on gunshot and other injuries of the nerves, laid the foundation in America of modern neurological surgery.

The years 1916–1918 of the World War saw 216 of the Fellows of the College, to use the words of Dr. Richard Harte in his Presidential Address of 1919, "at their post of duty, oblivious to all surroundings, quietly performing their duty, regardless of all conditions, except that of alleviating suffering as they found it."

One, Dr. Alfred Reginald Allen, died in action, September 30, 1918, and Dr. Henry Clemont Welker died of disease at the Walter Reed Hospital on May 2, 1918.

To only a few of these public-spirited works of the College has it been possible to make reference. They constitute, as Dr. Stillé has said, an imperfect catalogue, but "they indicate the sympathetic interest of the College in whatever concerned the progress and interests of medicine and the welfare of the community."

The Sections of the College

In 1893 at the suggestion of Weir Mitchell, then its President, the College voted to extend its scientific activities by organizing a number of sections devoted to individual departments of medicine. The Section on Ophthalmology has the honor of being not only the first to organize (1893), but also one of the two of the earliest sections which still continue, the other being that on Otolaryngology. The Sections on Orthopaedic Surgery and General Surgery, organized in 1893 and in 1894, soon united, but the resultant Section on Surgery came to an end a few years later. The Section on Gynecology had a somewhat longer life, functioning until 1907.

The Sections at the present time, in addition to those on Ophthalmology and on Otolaryngology, are devoted to the fields of General Medicine, Medical History, and Public Health and Industrial Medicine. The meetings are held in the lecture halls of the College ordinarily once a month from October to May, and are usually open to physicians and medical students outside the Fellowship of the College. A large number of notable papers have been read before the sections not only by the members, but by distinguished guests. The Section on Medical History has for the past seven years held an annual Students' Night in Mitchell Hall, a function suggested by Dr. David Riesman. On these occasions the Great Hall of the College is thronged with the medical students of the city. Usually some single phase of medical history is discussed by well-known speakers and the resources of the library are drawn upon for graphic illustration.

The Library

Of the many achievements of the College, the establishment of its library, which now has a prominent position among the great medical libraries of the world, must take place in the foremost

rank. First formally considered in June, 1788, the library actually began with Dr. John Morgan's donation of twenty-four volumes. It is not possible, nor indeed necessary, in this account to record in detail the gradual acquisition of books, nor to speak of the periods of time when the library was little used, when its development was puny, and its existence was threatened. These have been well described in the communications by Mr. Charles Perry Fisher, Dr. James Tyson, and Dr. Frederick P. Henry. (13, 8*b*, 9.) At first books came in slowly, the gift of individual Fellows, who also gave money for the purchase of books, and certain sums in this respect were appropriated by the College. In 1818 the collection of books had grown of sufficient importance to require a catalogue, which was compiled by a Committee composed of Drs. William Currie, Samuel P. Griffitts, and Thomas T. Hewson, and which early in 1819 was officially accepted by the College. Among these earliest books, it is interesting to note, were the works of Hippocrates, Aristotle, and Galen of the ancients, Vesalius, Fabricius ab Aquapendente, Harvey, Paré, Boerhaave, Ramazzini, Lettsom (gift of the author), Astruc, Alpinus, Sydenham, Tissot, Van Swieten. Most precious of all, a copy of Morgagni's De sedibus et causis morborum, with an inscription from the author to Dr. John Morgan, *viro experientissimo et humanissimo.* This latter seems to have been in Morgan's original gift, an early forerunner of the many notable treasures which the library was later to possess.

Your ever affect.ᵉ Brother
John Morgan

In 1825, the library of the Kappa Lambda Society was acquired; in 1844 there was purchased the collection of Dr. J. C. Otto, pioneer in the study of hemophilia, and one of the College's most distinguished Fellows. In the next year the library ob-

tained a number of books from various Fellows, particularly from Drs. Henry Bond, D. Francis Condie, Isaac Parrish, and George B. Wood, and in 1855 was the recipient of many volumes from Mrs. Moreton Stillé. In 1856 the Betton collection, numbering 1265 volumes, was added to its shelves, so that in 1859 the library contained about 4000 volumes and a number of pamphlets. But, to quote from Mr. Charles Perry Fisher, the most important epoch in the history of the library was the foundation of the Lewis Library in 1864, whereby more than 2500 choice volumes in the finest condition were added to the collection as the gift of Dr. Samuel Lewis. During his life Dr. Lewis gave to this library his constant care and attention, so that at the present time, with the additions which he made and with those made by his many friends, it contains 13,899 volumes. In 1928, however, in accordance with current library practice, the books of the Lewis Library were renumbered and classified, and, bearing a special bookplate, were merged with those of the general library, the *rariora* being kept in a special room named for Dr. Lewis.

After this period of time the library rapidly increased in size and importance, and from 1882 until 1902 it acquired the libraries of a number of its Fellows, to wit: those of Drs. Charles D. Meigs, John Forsyth Meigs, R. M. Bertolet, William F. Jenks, Samuel D. Gross (this is the library of the Academy of Surgery and was accepted as a permanent deposit), H. Lennox Hodge, John F. Weightman, N. Archer Randolph, Jacob M. Da Costa, John Ashhurst, Jr., Alfred Stillé (the major portion of this library was first deposited in the Lewis collection), and William F. Norris. During this period numerous books were presented by many Fellows, a large collection coming from Dr. I. Minis Hays, and in 1900 nearly 7000 theses and inaugural dissertations were received, in a notable exchange of publications arranged with foreign universities largely by the efforts of Dr. W. W. Keen.

In the year 1901, with the aid of liberal subscriptions received from Drs. S. Weir Mitchell, John K. Mitchell, and George Fales Baker, the library of the late Dr. J. Stockton Hough, containing 3247 volumes and 2070 pamphlets, many of the books being of the greatest value and interest, was purchased. Soon after, the College received the library of the late Dr. Thomas M. Drysdale and large gifts of books from the Board of Managers of the Episcopal Hospital of Philadelphia. Through the efforts of Dr. W. W.

Ashhurst Room Containing Card Catalogue, Reference Books, and Photostats of Incunabula.

Keen, Sir William Osler, and Dr. William Landouzy, 940 inaugural French theses were obtained in 1907, and by exchange with the College *Transactions* about 700 volumes of these Paris theses are yearly added to the shelves. Dr. Keen was also most liberal in his donation of a number of exceedingly rare and valuable medical works, among which twenty-one are incunabula.

But the College has always been fortunate in the generosity of Fellows and other friends, and the good example set so long ago by John Morgan continues. It would not be possible to name all those to whose generosity the growth of the library is so much indebted, but valuable gifts of books have come also from the late Drs. A. P. C. Ashhurst, C. W. Dulles, H. A. Hare, J. B. Roberts, J. Alison Scott; from Drs. C. W. Burr, B. C. Hirst, E. B. Krumbhaar, F. R. Packard, G. E. de Schweinitz, J. C. Wilson, S. Lewis Ziegler, and many others. Through the good offices of Dr. Francis R. Packard, the College received from the library of the Pennsylvania Hospital a notable gift of over 600 rare books of which there were no copies in the College's library. The continued acquisition of rare and notable early medical works has been additionally fostered for several years past by a group of the Fellows united for this purpose as The Friends of the Library. Moreover, the prominent publishing houses of Philadelphia have always been most liberal in the presentation of books coming from their presses.

The library serves two functions, as it has done from the beginning. The first is that of supplying, to the fullest extent possible to it, the current medical literature, both books and periodicals; the second, and no less important in the eyes of its founders and their successors, that of being a place of resource for the rarer and more valuable works important in the history of medicine.

In the latter category, the library's collection of incunabula, books printed before 1500, is one in the front rank of such collections. It numbers at the present time 404, and the number of titles is equalled or surpassed by that of only one other similar collection in the country. Since a fourth edition of the College's catalogue of incunabula is expected to appear at this time, it will be sufficient here to call attention to but a few of the more notable of these books:

Celsus. De medicina. The College possesses all four of the Fifteenth Century editions of this work, the most notable being the first.

The story of its acquisition has often been told in illustration of Dr. Osler's method.[1] Coming upon the volume listed in the catalogue of a dealer in old and rare books, in London, Osler sent a clipping of it to Weir Mitchell, with this marginal challenge in pencil: "This is a superb copy. Why not bleed the Fellows of the College? I will go $25: W. O."[2] In the words of Dr. Keen, who was one of the contributors to the eventual purchase of the volume,[3] "Mitchell promptly phlebotomized the other Fellows and the book now ornaments our shelves." This book has another distinguished association: above the colophon may be faintly discerned the signature of Giorgio Antonio Vespucci, uncle of Amerigo.

Principal claimants to the honor of being the first medical work of size to be printed are these, of which the library has rare copies:

1. Jacobus de Dondis. Aggregator de medicinis simplicibus. [Strassburg, Adolf Rusch (the R-printer), ca. 1480.]
2. Johannes Gerson. De pollutione nocturna. [Cologne, Ulrich Zell, ca. 1472.]
3. Johannes Gerson. De cognitione castitatis et pollutionibus diurnis. [Cologne, Ulrich Zell, ca. 1472.]
4. Rabanus Maurus. Opus Universum. [Strassburg, the R-printer, ca. 1467.]
5. Rolandus Capellutus. De curatione pestiferorum apostematum. Rome, Ulrich Han, [ca. 1475].

And of the first printed medical monographs, the library has first editions of the following:

1. Benvenutus Grassus. De oculis eorumque aegritudinibus et curis. [Ferrara], Severinus Ferrariensis, [1474].
2. Bartholomaeus Metlinger. Regiment der jungen Kinder. [Augsburg, Günther Zainer, 1473–4]. (The second printed work on pediatrics. It was preceded in 1472 by Paulus Bagellardus' De infantium aegritudinibus et remediis, of which the library has a copy of the second edition, printed at Padua in 1487.)
3. Isaac Judaeus. De particularibus diaetis. [Padua], Matthaeus Cerdonis, 1487. (The first printed book on diet.)
4. Simon Genuensis. Synonima medicinae. Milan, Antonius Zarotus, 1473. (The first pharmaceutical dictionary.)

[1] Keen, W. W. A tribute to Sir William Osler. Sir William Osler Memorial Number, *Canadian Medical Association Journal*, July, 1920, p. 40; Cushing, Harvey. The life of Sir William Osler. Oxford, Clarendon pr., 1925, vol. I, p. 277, note 1; Krumbhaar, E. B. Osler's connection with the library of the College of Physicians of Philadelphia. Sir William Osler Memorial Volume, Bulletin no. IX, International Association of Medical Museums, 1926, p. 240.

[2] The original clipping, with Osler's pencilled comment as given above (differing slightly from the wording as given in the references in note 1), is pasted on an added fly-leaf of the volume.

[3] As was also the author of this paper. [Librarian's note.]

Norris Room: Current Periodicals and Continuous Exhibits of Rare Books.

5. Aegidius Corboliensis. Carmina de urinis. Padua, Matthaeus Cerdonis, 1483.

Unfortunately, the early archives of the library do not record the dates of acquisitions, so that it is not possible to name the first of the incunabula to be acquired. But it is wholly likely that Dr. Lewis' original gift of rare books in 1864 contained some of them. In later years a strong impetus was given to the growth of the collection by the energetic interest and the generosity of Drs. S. Weir Mitchell, W. W. Keen, and George Fales Baker, among others.

In 1916 a photostat machine was installed in one of the study rooms, and since that date 302 of the incunabula have been photostated, the reproductions being bound and deposited in special cases in the Ashhurst room, where they are easily accessible to the readers. These photostatic copies are permitted to be withdrawn from the library and have proved of inestimable aid to research workers in many parts of the country. The photostat machine serves, also, a further use, as may be seen from the fact that in 1933 nearly 500 prints were made for Fellows and others.

The library has acquired through the years other notable collections of which the College may justly be proud. Among these should be singled out its editions of William Harvey's works, forty-four of the fifty-four recorded editions, one of the largest collections of Harveiana in the world; and one which includes the first edition of the De motu cordis, and, even more notably, the Bologna edition of 1697, no other copy of which is known to exist.

The library is rich, also, in its collection of 108 of the early editions of Galen, and in its sixty-six editions of the Regimen sanitatis of the School of Salernum.

The library catalogue of individual books of the greatest rarity and value in the history of medicine is so extended as to make a selection from it invidious. Characteristic of its quality and of the devoted spirit of the College which has maintained this quality, is the recent magnificent gift from Dr. Alfred Stengel, President of the College, of the life-sized anatomical plates, in color, with explanatory text, by François Antommarchi,[1] physician of Napoleon at St. Helena. The two volumes, handsomely bound,

[1] Antommarchi, F. Planches anatomiques du corps humain exécutées d'après les dimensions naturelles, accompagnées d'un texte explicatif. Publiées par le Comte de Lasteyrie. 2 vols. Paris, 1826.

were originally in the library of the Empress Marie Louise and are stamped with her monogram.

Among the rarest of imprints of our own country is the following:

CADWALADER, THOMAS. An essay on West-India dry-gripes. Philadelphia, B. Franklin, 1745. (This is the only known copy to have the original two prefaces, one of which was suppressed.)

PRIVATE STUDY ROOM.

The collection of manuscripts, which includes the original manuscript of the Cadwalader essay, presented by S. Weir Mitchell, has received a most notable addition recently, through the mediation of a former President of the College, Dr. Francis R. Packard, representing the donors, the late Mr. John Cadwalader, and his family. This is the manuscript of Dr. John Mitchell's Account of the yellow fever in Virginia in 1741–42, written in 1748. Benjamin Rush, in his account of the yellow fever in 1793,[1] states that this manuscript had been put into his hands by

[1] Rush, B. An account of the bilious remitting yellow fever, as it appeared in the city of Philadelphia, in the year 1793. Phila., Dobson, 1794, p. 197.

Benjamin Franklin, to whom it had been given by the author. In the words of Dr. Packard, it is a manuscript "of prime importance in the history of American medicine, . . . valuable because of its authorship, its association with Benjamin Franklin, and as a source of inspiration to Benjamin Rush."

The oldest manuscripts in the collection are a Fourteenth Century illuminated copy of Bernard de Gordon's Lilium medicinae, which came to the library at the death of Sir William Osler, as part of a bequest of a notable volume to each of the libraries with which he had been in intimate contact; and a copy of Constantinus Africanus' Liber viaticus of the same period.

The library is divided into the General Library, the S. D. Gross Library, and the Library of the Obstetrical Society of Philadelphia, and in 1933 the total number of volumes in these collections was 173,021, to which should be added 26,794 theses and dissertations, and 211,793 unbound pamphlets. The number of portraits listed was 27,206.

Naturally, the expense of maintaining so important a collection of books is considerable, and since the commencement of its steady growth, in 1866, the fixed charges against the library have grown greater year by year. These are met, in addition to an annual appropriation from the College, by the income from thirty-nine funds established by the generosity of Fellows and friends of the College. The following Fellows and friends have devoted to the support of the Library, funds of $5000 or more: Dr. George Fales Baker, Mrs. W. T. Carter, Dr. F. X. Dercum, Dr. L. A. Duhring, Dr. A. A. Eshner, Mr. Clement A. Griscom, Dr. R. H. Harte, Dr. W. F. Jenks, Dr. W. W. Keen, Dr. H. Leffman, Dr. Morris Longstreth, the brother and sisters of Dr. H. Magee, Dr. J. E. Mears, Dr. S. Weir Mitchell, Mrs. Lewis Rodman, Dr. J. William White, Mrs. Mifflen Wistar, Dr. George B. Wood, Dr. S. Lewis Zeigler. To Dr. Duhring, notably, the library is indebted for two funds, one of approximately $258,000 and the other of $5000, the incomes from which are devoted respectively to the general purposes of the library and to the purchase of books.

For the last ten years about 1500 volumes have been purchased annually with the funds of the College, but the accessions amount to double that number owing to the generosity of authors, publishers, and friends to whom reference has been made.

It is interesting to note that from 1896 to 1933, 25,179 new

medical publications in English, French, German, and a number of other languages, have been added to the library, and of these 1294 were written or edited by Fellows of the College.

Vestibule Leading to Mitchell Hall with Doors Leading to Ashhurst and Norris Rooms.

The current literature of the day in all scientifically important modern languages is represented by periodical publications, and at this time the total number of such publications received is 1391.

The library is free, and is open to anyone who is interested in the volumes which rest upon its shelves. Only Fellows have the privilege of taking books from the building, but to anyone introduced by a Fellow the same privilege is granted. The advantages of the library are freely utilized; for example, in 1908, more than 12,000 visitors were registered and nearly 23,000 books were consulted. Twenty-four years later, 14,000 were registered and over 85,000 books were consulted. It is unnecessary, as the late Dr. Frederick P. Henry said, to add to this statement to prove that the College of Physicians possesses a real working li-

Mitchell Hall, Where the Monthly Meetings of the College, and the Public Lectures, are Held.

brary. Its great influence is evident, and it has done much to maintain the well-known literary reputation of the profession of this city in medical matters.

The Homes of the College of Physicians

Since the institution of the College on January 2, 1787, until its removal to its present splendid quarters, five homes have sheltered the members of its guild and housed the treasures of its library. These abodes, in the language of Dr. Tyson (*8a*), were, first, the Academy building on Fourth Street for nearly five years; second, the hall of the Philosophical Society at 204 South Fifth Street for nearly fifty-four years; third, the Mercantile Library on Fifth Street for seven years; fourth, the Picture House in the Pennsylvania Hospital grounds for eleven years; and, fifth, its own hall at Thirteenth and Locust Streets from March, 1863, until November 10, 1909, when it moved into its present quarters, ordinarily known as the New Hall of the College of Physicians.

As the College increased in influence and membership, it became evident that new surroundings were necessary, and the first building fund was established November 2, 1849, a memorable date in its history. On December 18, 1861, the College determined to begin the construction of the building at Thirteenth and Locust Streets, which was completed and occupied for the first time in March, 1863. The College owed this home in large measure to the liberality of George B. Wood and the unceasing activity of Isaac Hays, Chairman of the Building Committee. Here the College remained until November, 1909, but for a long time prior to its removal it was evident that these quarters in the old ivy-twined building, loved and interesting as they were, could no longer adequately store the ever-increasing library nor accommodate the various meetings which took place within its walls. It would not be profitable to describe the various plans which were proposed before finally it was decided to purchase the lot upon which the present College building stands. These discussions lasted for a period of eight years, and after the institution of a third building fund on January 21, 1903 (a second building fund had been begun on April 7, 1875), the lot on Twenty-second Street above Chestnut was purchased on May 29, 1903. The corner-stone of the new building was laid by Weir Mitchell on April 29, 1908, and the building was completed and occupied on November 10

and 11, 1909, and dedicated with impressive ceremonies, lasting for two days.[1]

The erection of this building was in largest measure due to the unselfish and untiring activity of the Funds Committee,[2] to the liberal contributions of the Fellows, and particularly to the energy and generosity of Dr. S. Weir Mitchell. The contributions thus

PRESENTATION OF THE NEW HALL OF THE COLLEGE OF PHYSICIANS, NOVEMBER 10, 1909.

Drs. W. J. Taylor (Secretary of the Building Committee), Louis Starr and Richard A. Cleeman (Censors), George E. de Schweinitz (Vice-President), Richard H. Harte (Treasurer), Mr. Andrew Carnegie (Benefactor), S. Weir Mitchell (Censor), W. W. Keen (Former President).

received, together with the splendid donation of Mr. Andrew Carnegie and the generous financial aid given by Mrs. Frederick Penfield, Mrs. S. Weir Mitchell, Mr. Clement Griscom, Mr. W. H. Dunwoody, Mr. Clement Newbold, Mr. W. W. Frazier, Mr. C. C.

[1] The arrangements of the ceremonies of dedication were successfully carried out by a committee composed of Dr. Charles H. Frazier (Chairman), Dr. George W. Norris, Dr. T. Mellor Tyson, President, and the Vice-President of the College.

[2] The committee to collect funds was composed of Dr. S. McC. Hamill (Chairman), Drs. T. G. Ashton, J. H. Girvin, D. Braden Kyle, David Riesman, Alfred Stengel, G. C. Stout, C. H. Frazier, and the Vice-President of the College.

Harrison, Mr. Frederick Vanderbilt, Mr. Eckley B. Coxe, Jr., and many others, whose names are gratefully recorded in the *Transactions*,[1] furnished enough of the needed funds to authorize the Building Committee[2] to proceed with the erection of the New Hall, and to spend the sum of money that was indicated as necessary by the plans presented by the architects, Messrs. Stewardson

PRESENTATION OF THE NEW HALL OF THE COLLEGE OF PHYSICIANS, NOVEMBER 10, 1909.

Drs. W. J. Taylor, Louis Starr, Richard A. Cleeman, George E. de Schweinitz, Richard H. Harte, Mr. Andrew Carnegie, S. Weir Mitchell.

and Jamieson. So satisfactory was the work of this Committee that in his final report its efficient secretary, Dr. William J. Taylor, whose work deserves the highest praise, was able to exhibit a balance on the credit page of his ledger. Not only was the building erected according to the plans drawn by the architects and accepted by the Fellows of the College, but with the aid of

[1] *Transactions of the College of Physicians*, Third Series, vol. XXXI, 1909, pp. 451–455. This volume also contains a full account of the exercises on the occasion of the dedication of the New Hall of the College of Physicians.

[2] The Building Committee was composed of Drs. James C. Wilson, George B. McClellan, J. K. Mitchell, Richard H. Harte, Frederick P. Henry, William J. Taylor, and the President and the Vice-President of the College.

liberal subscriptions from friends and Fellows of the College the various halls presently to be referred to were furnished in an eminently satisfactory manner. Such indebtedness as remained was neutralized by the generosity of Mr. Edward Stotesbury, in the presentation of $75,000, given, to use his own words, "to relieve the College from debt and leave it free to pursue its career of honorable usefulness."

The New Hall of the College of Physicians

Thus it came about that the sixth home of the College of Physicians was erected and occupied. Speaking of this new hall, the Vice-President of the College, addressing the Secretary of the Building Committee on the day of presentation, said: "On behalf of the President and officers, and in the name of the Fellows of the College, I have the honor to accept this home, of mark beyond all others, to accept it with pride in the nobility of its structure, with satisfaction in the amplitude of its unrivalled equipment, and with rejoicing in the completion of its brave and generous plans." It is a home of which the College and its Fellows may well be proud, as indeed may be the citizens of the city of Philadelphia. It affords ample space for the library, it provides the Fellows with adequate reading rooms, it contains large halls suitable for lectures and for regular meetings, not only of the College of Physicians, but of other scientific societies which are accommodated within its walls, and it contains the splendid collection of the Mütter Museum, composed of anatomical and other specimens, as well as the offices of the Directory of Nurses and those used by the librarian and his staff of assistants.

The style of architecture is English, of about the end of the Seventeenth Century, the material is dark-red brick laid Flemish bond, with basement cornices, pilasters, and other trimmings, of Indiana limestone. The building itself has a frontage of 108 feet and a depth of 150 feet, and stands upon a lot of ground 130 feet front by 180 feet deep, a lot, therefore, of sufficient size to permit the building to be placed at a considerable distance from the street line on all sides. At the street line is a low brick wall with high brick posts and an iron railing between them. Through the liberality of friends and patients of the late Dr. John Forsyth Meigs, and under the supervision of Dr. John K. Mitchell, the area between the railing and the building proper has been planted

with shrubbery and grass. Owing to the great generosity of Mr. Eckley B. Coxe, Jr., certain unsightly buildings in the neighborhood of the College, to wit, a large stable and three mean houses, were acquired by the College and razed to the ground. The area is now a garden which serves as a memorial to the late Vice-President of the College, Dr. Wharton Sinkler. It is hoped that soon it may be converted into a botanical garden following the wish expressed by Benjamin Rush in his first paper read before the College.

Entrance to the Hutchinson Reception Room.

To accommodate the library the bookstack was erected, which consists of seven tiers and has a capacity of 300,000 volumes. Although fireproof construction is used throughout, this stack is cut off from the rest of the building by firedoors, and is provided with wire glass windows in metal frames, the windows being protected by rolling steel fire-shutters.

The front vestibule and main hallway and staircase are floored and wainscoted with Vermont marble of different shades. The

reception hall of the first story is wainscoted to the ceiling with "silver ava," a light-gray wood, having been selected with a view to harmonizing with the marbles in the adjoining hall. On the right of the vestibule are the offices of the Nurses' Directory, and on the left the office of the College, beyond which, opening to the left, is the Hutchinson reception room, provided by the descendants of Dr. James Hutchinson, and the family of the late Dr. James H. Hutchinson. A broad stairway leads from the first floor upwards, and at its head stands the splendid statue of Aesculapius, a replica of the one in the Vatican, the gift of Dr. Richard H. Harte. Beyond, reached by two shorter stairways, is the large vestibule leading into the monumental hall which occupies the front portion of the second story. This is the meeting place of the Fellows of the College and is also a portrait gallery, for upon its walls hang the portraits of the former Presidents and Vice-Presidents of the College. This hall, named Mitchell Hall, in honor of Weir Mitchell, was furnished by the generosity of many friends and Fellows of the College, and particularly by the active interest of Dr. John H. Musser. It has oak wainscoting, pilasters, a deeply coffered, plastered ceiling, and a seating capacity of 500. Its proportions, design, and decorations combine to make this a hall of great dignity and beauty. From its eastern end doors lead into the Ashhurst and Norris rooms (see next paragraph). At the upper end on each side are the entrances to the Wood and Packard rooms. The former was furnished by the Wood family and contains a marble bust of Dr. George B. Wood, the gift of Messrs. Craige, Walter, and J. Bertram Lippincott, and a bronze bust of Dr. Horatio C. Wood, the gift of Messrs. George Wood and George Wood Bacon, its walls being lined with the mahogany bookshelves of the late Dr. George B. Wood. The latter room was furnished by the brothers of the late Dr. Frederick A. Packard, and in it the Library Committee holds its monthly meetings. There are displayed in cases here, various medical memorabilia which have come into the College's possession.

In the lower hall to the right and left are respectively the Thomson and the Cadwalader rooms, the first furnished by the children, nephew, and nieces of the late Dr. William Thomson, and the second by Mrs. Weir Mitchell. On each side of the head of the stairway are respectively the Norris and Ashhurst rooms,

the first furnished in memory of Dr. William F. Norris, by his children, and by Mr. Charles Norris and Dr. G. E. de Schweinitz, and the second furnished by Dr. Richard H. Harte in memory of the late Dr. John Ashhurst, Jr.

Main Stairway with Statue of Aesculapius Presented by Dr. Richard H. Harte.

The Norris room contains the periodicals, and upon its shelves, suitably lighted, more than 1200 current periodicals are placed. Also here may be seen many rare editions of old medical works, assembled in connection with special meetings or anniversaries, or in illustration of some special phase of medical history. The Ashhurst room contains the card catalogue, works of reference,

and the bound volumes of the most important and actively used medical journals, the only books which are not in the bookstack. In each of these rooms the walls are hung with numerous prints, engravings, photographs, and other pictures. Beyond the stairway in the lower hall is the Mütter Museum and its splendid collection. This room is furnished with an iron gallery around three sides, so as to give a large amount of wall space for cases.

Cadwalader Hall.

An important feature of this new hall of the College of Physicians is the private study room. A large number of these rooms are provided on the second and mezzanine floors, and here the Fellows of the College and their invited guests may work free from interruption and surround themselves with the volumes which they require in their special researches.

The Cadwalader and Thomson rooms are utilized by various scientific societies, to which they are rented by the Hall Committee of the College; for example, the Pathological Society, the Neurological Society, the Philadelphia Academy of Surgery, the Obstetrical Society, and the various Sections of the College itself. Prior to the purchase of its own building the meetings of the County Medical Society were held in the Thomson room.

Opening from the left of the northern end of the Hutchinson reception room is the entrance to the Gross Library, furnished by the Gross family, its handsome bookcases being the gift of Dr. J. Ewing Mears; the meetings of the Council of the College until recently took place in this room. At present the Hutchinson room is utilized for this activity. The entire equipment of the building, insofar as heating, lighting, ventilation, vacuum cleaning, pneumatic tubes, electric lifts, and intercommunicating telephone system are concerned, represents the latest and most approved designs.

THOMSON HALL.

A large kitchen in the basement makes it possible to give the official dinners of the College in the New Hall. Provisions for these dinners and other social functions arise from the income of the Weir Mitchell Entertainment Fund.

To two adjuncts of the College of Physicians only a brief reference has been made, and therefore a further word in regard to them follows:

NURSES' DIRECTORY

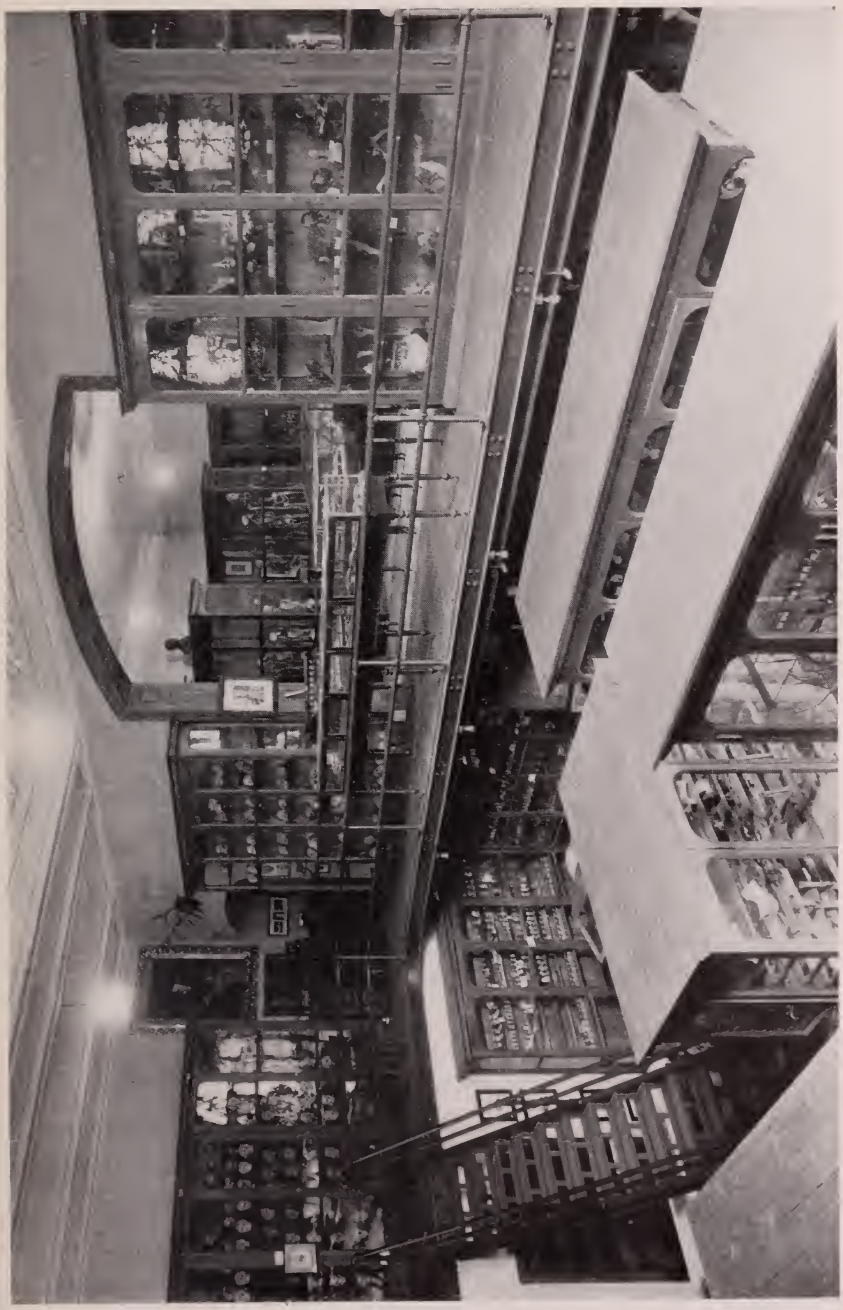
At the suggestion of Dr. S. Weir Mitchell, a Directory for Nurses was organized and its first office opened in May, 1882; in 1932 it celebrated, with a program at the College, fifty years of

admirable service to the community. The income of the directory for many years exceeded its needs, and therefore its committee was able to add materially to the funds required in other portions of the College, notably to those of the library. The fee formerly asked for furnishing a nurse is now abolished, and, in the language of Dr. Mitchell, the Directory is as free as is the library. Its great use can be described in a sentence, namely, that since 1882, 146,478 requests for trained nurses have been received by its directors.

Mütter Museum

In 1849, at the instigation of Dr. Isaac Parrish, a cabinet of pathological specimens was established, and later a curator was elected and a committee on the museum appointed. This museum, after thirteen years of healthy growth, was united with the Mütter collection. Dr. Mütter first offered his museum to the College in 1856, but for various reasons the agreement which constituted the transfer was not signed until December, 1858. The various terms of the bequest were carried out as carefully as possible by the College, and for this splendid collection of specimens, casts, oil paintings, water-colors, etc., special quarters were provided in the building at Thirteenth and Locust Streets, where it remained until it was transferred to its present situation in the New Hall. Not only did Dr. Mütter present his museum to the College, but with it came a handsome endowment, and the legacy provided for the appointment once in three years of a lecturer who should discourse on some subject connected with surgical pathology. With the approval of the College, the policy of the Committee on the Mütter Museum of late years has been to provide lectures yearly instead of every three years. The first lecture was delivered March 2, 1864, by Dr. John Packard, and since then this post has been occupied by many other distinguished surgeons and pathologists.

The museum itself, under the able management of the committees in charge of it, has grown to fine proportions. The Hyrtl collection of human skulls and preparations by erosion, and the Politzer ear specimens, are among its most notable possessions; to which have been added in recent years a Giant skeleton, a cast of Siamese twins, presented by Sir William Osler, with a scrap-book of clippings on the subject, and a collection of war specimens.



MÜTTER MUSEUM.

The Chevalier Jackson collection has also been added and he himself has assisted greatly in its preservation and its exhibition.

The museum is open to all research students, medical students, and physicians under proper regulations, and is constantly visited by those whose investigations require the study of its specimens. Greater attention has been given during recent years to complete description, historical and otherwise; a card system has been installed. The arrangement of the museum is slowly being changed so that related matters are grouped.

The collections of the museum and the other collections of the College, lodged in the library, have grown to such an extent that within the past year the Council has recommended the organization of a special committee to co-ordinate the collections and to govern the distribution of acquisitions among them. It is the intention that in the future the museum shall house the specimens of scientific interest, and the various collections in the library those of a personal or historical nature.

Abbe Cabinet

The Abbe Cabinet contains what is without doubt the College's most notable collection of personal memorabilia of medical men. The collection was inaugurated by the formal presentation by Dr. Robert Abbe on February 1, 1911, of the gold watch of Benjamin Rush, one of his most highly prized possessions and his constant companion. To this have been added in subsequent years Jenner's inkstand (the gift of Weir Mitchell), and a lock of his hair (presented by Sir William Osler); a small case of instruments, and a group of self-fashioned small glass tubes belonging to Lister, acquired through the kindness of Sir Rickman Godlee, a nephew of Lord Lister; a model of a tartrate crystal made and used by Pasteur (the gift of his former assistant, the late Dr. A. Calmette); and an instrument of precision, known as the "Quartz-piezo-electric" apparatus, devised by Pierre Curie and used by him and Mme. Curie, by whom it was presented to the College. The collection was endowed by Dr. Abbe before his death, and, as in the case of the famous "Gold-headed Cane," a nominal custodianship has passed through a succession of representative medical men, beginning with Dr. Weir Mitchell and including Dr. Simon Flexner of New York, **Dr. William H. Welch of Baltimore, and Dr. W. W. Keen of Philadelphia. The present custodian is Dr. William Mayo of Rochester, Minn.**

Prize Funds

The College of Physicians administers two prize funds, the income of which supports the Alvarenga Prize and the Nathan Lewis Hatfield Prize and Lectureship. The first of these funds was given to the College in 1890 by the late Pedro Francisco Da Costa Alvarenga, of Lisbon, Portugal, who was an Associate Fellow of the College, and the income is awarded to the successful competitor, who may write on any subject in medicine, by a committee yearly appointed. Up to the present year the prize has been awarded thirty-one times.

Medal Struck on the Dedication of the New Hall of the College. Designed by Dr. R. Tait McKenzie, Fellow of the College.

The deed of trust of the Nathan Lewis Hatfield Memorial Fund is administered by three trustees, and the income, which must never be less than $500, is awarded by a committee appointed triennially by the President of the College to the successful author of an essay which must represent original research in medicine; or this income may be applied by the committee to the compensation of lecturers.

Public Lectures

The public lectures on Great Doctors and Achievements in Medical Research, were founded in 1910 according to a suggestion of Weir Mitchell, who delivered the first one of the series, nine in all. Not only physicians, but prominent citizens of the municipality were invited. None has taken place since 1916. They were highly appreciated by the laity and should be resumed.

A very important lectureship was founded in 1917 by Mr.

Clement B. Newbold as a memorial to his wife, Mary Scott Newbold. Thus far thirty-two lectures, always well attended, have been delivered, and the lecturers have been distinguished men of this country and from abroad.

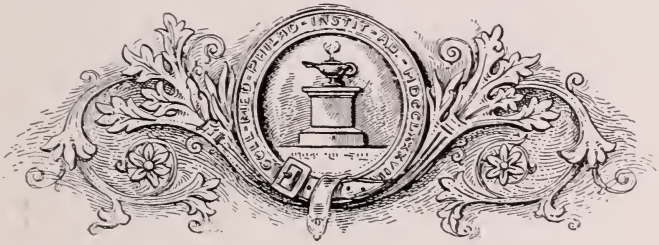
The Weir Mitchell Oration was founded in 1919, when the first lecture appropriately was given by Dr. C. W. Burr, who had been an important member of Dr. Mitchell's staff at the Orthopedic Hospital and Infirmary for Nervous Diseases. Thus far five Orations have been delivered.

Since the foundation of the College on January 2, 1787, 1347 Fellows, 99 American Associate Fellows, 58 Foreign Associate, and 8 Corresponding Fellows have been elected. The roll-call at the present time is: Resident Fellows, 549; Non-resident Fellows, 37; Foreign Honorary Fellows, 8; American Honorary Fellows, 8.

The papers presented at the monthly scientific meetings of the College are worthy of the dignity of their surroundings. Since the Sections have been established the number of papers read by Fellows at these monthly meetings has somewhat decreased, but there has been an increase of valuable addresses by distinguished men from other cities and countries. Fellows of the College are permitted to invite physicians not members of the College to attend.

As constituted at present, the affairs of the College are administered by the following officers: President, Vice-President, four Censors, a Secretary, Treasurer, and Honorary Librarian. The Council of the College, composed of the officers named, the Chairman of each of the nine standing committees, and six elective Councillors, has supervision of the affairs of the College and executive capacity to act upon and dispose of any business referred to it by resolution of the College, specifying power to act. The Council reports its decision upon all matters referred to it by the College for such opinion, and submits from time to time such suggestions as it shall believe to be adapted to promote the objects for which the College was instituted. It receives the monthly reports of the various standing and special committees and makes a monthly report at each stated meeting of the College. It passes upon the names of all those proposed for Fellowship. The standing committees are these: Publication, Library, Mütter Museum, Hall, Directory for Nurses, Finance, Entertainment, Scientific Business, and Public Health and Preventive Medicine.

In his inaugural address the first President of this College of Physicians prayed that wisdom, prudence, discretion, and judgment would be granted unto the Fellows to conduct their affairs to good effect and useful purposes, and prayed further that those who heard him and that those who were to follow in their footsteps would publicly and privately serve their generation. This we believe they have done, and we know that the College of Physicians has been a great good in this city, in this country, and in all that pertains to the advancement of medical science in all lands.



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30. Report of the committee . . . appointed to investigate the efficiency of our quarantine arrangements for the exclusion of cholera and other epidemic diseases. *Medical News.* 1887, vol. LI, no. 18 (Extra Issue).
31. Centennial celebration catalogue of loan collection of portraits. 1887.
32. Mitchell, S. Weir. Some recently discovered letters of William Harvey, with other miscellanea. With a bibliography of Harvey's works, by Charles Perry Fisher. Phila. (Dornan, for the Transactions of the College of Physicians of Philadelphia), 1912.

1934 1934

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CALENDAR

Scientific Meetings

First Wednesday of each month, except June, July, August, and September, viz., March 7, April 4, May 2, October 3, November 7, December 5, 1934, January 2, February 6, 1935.

Business Meetings

May 7, December 5, 1934; January 7, 1935

Stated Business

January—Presentation of Budget by Committee on Finance; President's Address; Election of Officers and Standing Committees; Election of New Fellows; Announcement of Alvarenga Prize.

December—Nomination of Officers and Standing Committees for the ensuing year.

Council Meetings

Tuesday, eight days before College meeting, viz., March 27, April 24, May 29, September 25, October 30, November 27, December 25, 1934, January 29, February 26, 1935.

Sections of the College

Ophthalmology—Meets third Thursday, October to April. Chairman, J. Milton Griscom, M.D.; Clerk, A. G. Fewell, M.D.; Executive Committee, L. F. Appleman, M.D., C. E. G. Shannon, M.D., H. Maxwell Langdon, M.D.

Otolaryngology—Meets third Wednesday, October to April. Chairman, Benjamin D. Parish, M.D.; Clerk, Karl M. Houser, M.D.; Executive Committee, James A. Babbitt, M.D., George M. Coates, M.D., Ralph Butler, M.D.

General Medicine—Meets fourth Monday, October to May inclusive. Chairman, Richard A. Kern, M.D.; Clerk, Harold W. Jones, M.D.; Executive Committee, Wm. Egbert Robertson, M.D., C. C. Wolferth, M.D., Henry K. Mohler, M.D.

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Superintendent—Walton Brooks McDaniel, 2d.

Clerk of the College—Helen Farrell.

Bell Telephone—Rit. 6626.

Mütter Museum open daily 1 to 4 P.M. Saturday, 9 to 12 A.M.

Curator—Harry P. Schenck, M.D.

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OF

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A SECOND EDITION

REVISED BY

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Senior Censor of the College and formerly President

AND

W. B. McDANIEL 2D, PH.D.
Librarian of the College

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OF THE COLLEGE'S INSTALLATION IN ITS PRESENT HOME

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